SPECIAL EDITION

SLUG NEWSLETTER

sinclair LOUISVILLE USERS GROUP $1.00

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WELCOME TO THE
"SECOND ANNUAL T/S COMPUTERFEST"
AND TO THIS SPECIAL EDITION OF THE "SLUG NEWS LETTER". INSIDE YOU WILL FIND LISTINGS, TIPS, CARTOONS, AND HARDWARE PROJECTS FROM THE LAST THREE YEARS OF "SLUG". WE HAVE A LITTLE BIT OF EVERYTHING FOR THE 81, 1000, 1500, 2068. THERE ARE GAMES LIKE MONOPOLY (JUST LIKE THE BOARD GAME FOR THE 2068. YOU WILL FIND A GAME FOR THE "BATTLESHIP 1000", YES THE OLD STAND-BY BATTLESHIP. IF BANNERS ARE WHAT YOUR LOOKING FOR WE HAVE A MC BANNER PROGRAM YOU CAN KEY INTO YOUR 1000. AND WHILE YOU HAVE YOUR PRINTER HOOKED UP YOU CAN TRY THE HI-RES STRIP CHART PROGRAM ALSO. SYNCWARE NEWS COMPETITION WINNER "PIX FIX" IS LISTED, THIS ONE IS WORTH THE TIME KEYING IN. WE ARE SURE YOU WILL FIND A PROGRAM YOU WILL ENJOY OR CAN'T DO WITHOUT, SUCH AS "TAPE TO TAPE" OR "SCREEN COPY".

THE SLUG NEWS LETTER IS PUBLISHED ONCE A MONTH BY THE "SINCLAIR LOUISVILLE USERS GROUP" LOUISVILLE KY. AND IS FOUR TO EIGHT PAGES EACH MONTH. IF YOU WOULD LIKE TO RECEIVE THE NEWS LETTER. FILL OUT THE COUPON BELOW AND SEND ALONG WITH A CHECK OR MONEY ORDER FOR ONLY $7.50 TO

S.L.U.G.
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.....
WHAT COMPUTER(S),PRINTER,INTERFACE,ETC. DO YOU USE?

.....

.....

.....

LINE-TRACE 1000

by BARRY NICHOLSON

TAKE THE PAIN OUT OF DEBUGGing TS 1000 programs with LINE-TRACE. This program is a machine code routine which uses interrupts to constantly monitor the operation of a basic program.

First lower RAMTOP by typing,
POKE 16389,127
Then LOAD the program amd RUN it. The CODE will be POKEd in, and the program will then NEW. You can now write or LOAD your BASIC program.

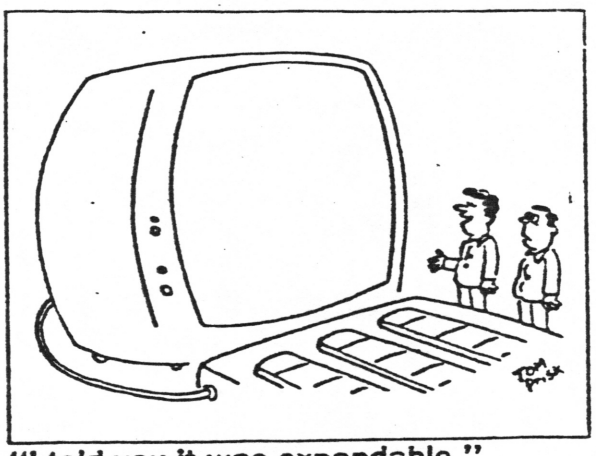
By typing in,
RAND USR 32512
You will activate the routine, and when the program is RUN the line numbers will be printed at the bottom of the screen as they are executed.
RAND USR 32517
turns the routine off.

The routine will deal with any BASIC program unless it uses the commands FAST or PAUSE.

When you type in the program SAVE a copy before you RUN it, just in case.

```
 10 REM ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
 35 REM ▓
 40 LET A$="DD216A7FC9DD2181020C
9E8036400DA0001002A3440253E7FA42
57C2003171802463767223440D0"
 45 REM ▓
 50 LET A$=A$+"CDBB02ED4B254022
254078C802ED423A2740B4B558060B21
3B40CB862008CB7ECB8C8C8"
 55 REM ▓
 60 LET A$=A$+"050037212740 3FCB
1010FE467BFEFE9F061FB6A01F77D3FF
2A0C40CBFCCD7B7FED5F010119"
 65 REM ▓
 70 LET A$=A$+"3EF8CDB5022BCD7B
7FC3127FDDE1FD4E28FDCB387E200C3E
FC06010DB5022BE3E3DDE9"
 75 REM ▓
 80 LET A$=A$+"79ED443C08D3FEDD
E53A0840CB7F2807DDE1E1D1C1F1C9DD
2A0C4011D702DD192A0740110A7F"
 85 REM ▓
 90 LET A$=A$+"1A4F131A47AFB7ED
423803C18F909C81CDD7700DD2379FE
012803131 8E20E0206DC10FE0D28C318
F7"
 100 REM ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓
          SHOULD =450
 110 LET b=32521
 120 FOR K=1 TO LEN A$ STEP 2
 130 POKE B,16*(CODE A$(K)-28)+C
ODE A$(K+1)-28
 140 LET B=B+1
 150 NEXT K
 160 NEW
 170 SAVE "TRAC▓"
 180 LET RT=32512
 190 IF (PEEK 16388+256*PEEK 163
89)=RT THEN RUN
 200 PRINT "RAMTOP NOT LOWERED T
O ";RT,,,"PLEASE LOWER RAMTOP BY
-",,,"     POKE 16389,127....ENTER
....THEN NEW ...THEN RELOAD "
```

"But it was so friendly in the store!"



"I told you it was expandable."

TS2068
1st Prize!
SyncWare News Competition

THE AMAZING 2068 PIX FIX

John T. Nguyen

Pix Fix is a program designed as an artists aid in creating computer art work. This program resembles MacDraw (for a lesser computer-ed.) to some degree. Pix Fix gives you the ability to zoom in on small sections of the screen and set or reset (Plot and Unplot) the individual bits in the screen display as you desire.

The screen is manipulated in both the screen display area and in high memory (50000d). A screen may be loaded into high memory to be modified. Subsequent screen saves may be loaded into other programs by LOAD "name"CODE 16384.

Enter the program listings or send $13.00 to John at the above address. He will send Pix Fix, A.R.T. (another utility) and four comic character displays, two of which are shown in the accompanying figures. (The artwork was done by the talented Vu Nguyen.)

Using Pix Fix

After loading a picture, you will be in the Big Pix mode. Part of the picture will be displayed in the upper left hand corner of the screen. Its enlarged version will fill the screen. By using <Caps Shift> and I, J, K and L (up, left, down and right, respectively); you may scroll the enlarged screen to various parts of your overall creation. I, J, K and L used without the <Caps Shift> will move the cursor around on the screen itself. These cursor control keys will henceforth be referred to as <Arrow> keys.

To view the entire picture, press <U>. Included in the picture is a small box which is used to enclose the area of the picture that you want to fix. Now use the arrow keys to move the box around. By holding down the <Caps Shift> and using the arrow keys, the box will move faster.

Pressing <O> will invert the video. <Y> will display the attributes associated with the picture in view. <P> will dump the picture to the 2040 printer.

Press <U> to enter Big Pix mode again. To see the row and column number, press <P>. Press <P> again to turn it off.

To enter the Draw mode, press <A>. The border of the screen will now be black. As you move the cursor, you will draw your art. To erase, press <S>. The border will now be Cyan. Again, move the cursor to erase. Press <D> to resume normal cursor movement. You may also press <O> to invert the screen in this mode.

If you can't remember all of the commands, press <H> for the help file. Press any key to go through the help file. Press <M> to go to the Main Menu. From this point you may Save or Load your display. There are several options here too.

You can Save your picture as a SCREEN$ or from memory location 50000. If you save a Screen$, then all of the attributes will be saved with your picture. If you save from high memory, then you have the option of saving 1/3, 2/3 or all of the picture. This will save loading time as you develop new drawings.

To clear your display and start fresh, press <X>. you will be prompted to verify your entry. Press enter to resume your work. To exit the program, press <Q>. DO NOT RUN the program! Use GO TO 1 to restart it. Have fun!!

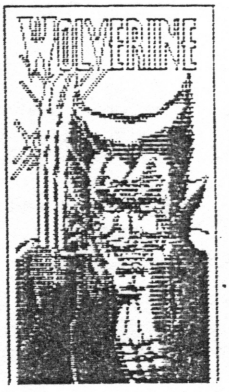
John T. Nguyen

Listing 1. PIXCODE
enter and run this program first to create and save the PIXFIX machine code.

```
  1 REM --- PIX.CODE ----
  3 CLEAR 36911
  5 POKE 23692,0
 10 LET BEGIN=100
 15 LET END=340
 20 FOR L=BEGIN TO END STEP 10
 25 PRINT "# WORKING ON LINE: "
;L: LET N=36912: LET SUM=0
 30 RESTORE L: LET N=N+6.4*L-64
0
 35 READ CSUM,X$
 40 FOR J=0 TO 63
 45 LET HI=CODE X$(J*2+1)-67
 50 LET LO=CODE X$(J*2+2)-67
 55 LET V=HI*16+LO
 60 POKE N,V: LET N=N+1
 65 LET SUM=SUM+V
 70 NEXT J
 75 IF SUM<>CSUM THEN PRINT "#
ERROR IN LINE: ";L: STOP
 80 NEXT L
 85 PRINT : PRINT "# YOU GOT EV
ERYTHING RIGHT !!": PRINT
 90 REM --- SAVE CODE5 ----
 95 SAVE "pix.code"CODE 36912,1
544: PRINT "# REWIND TAPE AND PR
ESS PLAY TO   VERIFY.": VERIFY "
pix.code"CODE
 100 DATA 6747,"JLCJCJCJMK0IOJMK
CJCJIRJKCRCRCR0IDKR0DKOKRIGCMK0I
RKMKIJOLJL0ICJGJCGF0CDCRDCRPOLF0
CKCKOPFCLCDMJJCKCGDFFPR0CCECREOL
OPGOLCDKDDHIMER0"
 110 DATA 6213,"CCEKCGCDC0CCOLCD
DDCCOLNIJJOLERMIJJOLM0JJOLRRKCN0
N0N0N0N0KCRRKCKCKCKCKCKCCDCDCD
CDCDCDCDCDDCFKJOR0FKFKFKFKDCFCJR
RRJRFCDCCCCKCOR0"
 120 DATA 6474,"RRR0COCKCCFKFKFK
FKR0JOFKDCKCKCKCKCKCKCKCCIHJDI
CCC0JLD0CCPH0H0PFCLCDDHCKFDLMRFE
IOLCOPIKLCJLR0DDFEIOLCEKCHDDKHLC
DKCFDDKPLC0D0DOH"
```

Listing 1 (cont.)

```
 130 DATA 7892,"0HONECONECONECON
EDONEDONEDOPHJLC0DODOH0HOPFCLCOP
IKLCODPDDOPHCOJNR0ECECNMPDDGCGJM
R0DKECMPOLCDKHHHOPFCLCDDHCKFDLOP
IKLCOLCDCRCJOPFC"
 140 DATA 7021,"LCOPIKLCOLCDJKFK
DDKHLCOPHJLCOLCDCCDKEDHCOFDDCCGC
0PNCOLD0EECDJKIROHOPFCLCOPIKLCOD
CODPJNR0CCECRDOLD0DMCDJKHIOHOPFC
LCOPIKLCODCGDPJN"
 150 DATA 6119,"R0CCECRDOLCDCCDK
EDHCOFJ0ERJJEFCNJKNDECRJOLCDCCDK
EDHCOFFICCEFCNJKNDECRKOLCDCCCCOH
CDCCCDOHOPFCLC0HCHOPFCLC0N0DCDEC
CC0PNCODCG0HCICD"
 160 DATA 6728,"DCR0ODJKR0GCEC0F
ODOHOPFCLCDDG0JNDL0HCIFROPFCLC0N
0DCDECCC0PNCODCGJKR0GCECOEOLCDCC
CFEDCCHKFIFKEFCNJKNDECRKOLCDECCD
EDEPNMDDCCHK0PNC"
 170 DATA 6343,"OLEMNCHOCDCCCC0P
GFNCHOENDDGFNNEF0HDFEDGOOF0PHEEK
DOF0CC0DN0EKCIJ00NJJ0NDK0MEFG0EF
GI0NFICC0NCNJLNCEKPPDFDKRG0DOLCD
CCCFEDHCPNDDCCHK"
 180 DATA 4508,"0PNCOLCCECCCCKCC
D0CCCKCKCCCJCCCFRKJRDROCFRFRCCCD
CCCFRKD0DROCFRFRCCCKCCCKCKCCCJCC
CRR0CCCDCCJRRFRRFRRCCRRRCCCDCCJR
RFRRFRRCCCCJCCCK"
 190 DATA 3649,"CKCCD0CCCKCKCCC0
CCIECDCCC0CCCKCKCCC0CCFCCCCRCCCK
CKCCCJCCCFLORJFKRNCFJICDRIJCDOJD
R0JGDRICCCCJCCCKCCECCCCKCCCJCCCR
RRRKJRRFRRFRRCCR"
 200 DATA 5390,"RRR0JRRFRRFRRCCC
CJCCCKCKCCCJCCCFRRRRDROCFRR0CCCD
CCCFRRKCDROCFRR0CCCKCCCKCKCCCJCC
CRR0CCCDCCJRRFRRFRRCCRRRCCCDCCJR
RFRRFRRCCCCJCCCK"
 210 DATA 4575,"CKCCD0CCCKCKCCC0
CCGECICCC0CCCKCKCCD0CCCKCKCCCJCC
CFNORJRKRRCCCDCCJCCDR0RCDOJCRKJO
DR0CCCCJCCCKCCECCCCKCCCJCCCRRRR0
JRRFRRFRRCCRRRR0"
 220 DATA 5321,"JRRFRRFRRCCCCJCC
CKCKCCCJCCCFRRRRDROCDRROCCCDCCCF
RRKCDROCDRROCCCKCCCKCKCCCJCCCRR0
CCCDCCJRRFRRFRRCCRRRCCCDCCJRRFRR
FRRCCCCJCCCKCKCC"
 230 DATA 6360,"C0CCDOLCCCC0CCCK
CKCCC0CCGGCKCCC0CCCKCKCCD0CCCKCK
CCCJCCCFNORJRKRRCCCDCCJCCDR0RJP0
JCJCJODR0CCCCJCCCKCJRRRRRRRRRRRR
RRRRRRRRRRRRRR"
 240 DATA 9156,"RRRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRCCKCCCJCCCRRRR0
JRRFRRFRRCCRRRR0JRRFRRFRRCCCCJCC
CKCKCCCJCCCFRRR0DROCCRROCCCDCCCF
RRKCDROCCRROCCCK"
 250 DATA 3807,"CCCKCKCCCJCCCRR0
CCCDCCJRRFRRFRRCCRRRCCCDCCJRRFRR
FRRCCCCJCCCKCKCCC0CCEELCCCC0CCCK
CKCCC0CCFKRCCCC0CCCKCKCCD0CCCKCK
CCCJCCFFN00JFKPR"
 260 DATA 5725,"CCCDCCJCCDN0RFLO
JCJCJGDN0CCCCJCCCKCKCCD0CCCKCKCC
CJCCCRRRRRJRRFRRFRRCCRRRR0JRRFRR
FRRCCCCJCCCKCKCCCJCCCFRRR0DROCCR
R0CCCDCCCFRRKCDR"
 270 DATA 3510,"0CCRR0CCCKCCCKCK
CCCJCCCRR0CCCDCCJRRFRRFRRCCRRRCC
CDCCJRRFRRFRRCCCCJCCCKCKCCC0CC0E
LCCCC0CCCKCKCCC0CCGFCCCRCCCKCKCC
D0CCCKCKCCCJCCFF"
 280 DATA 5913,"NP0JFKORCCCDCCJC
CDL0RNL0RCJCJDDL0CCCCJCCCKCKCCD0
CCCKCKCCCJCCCRRRRRJRRFRRFRRCCRRR
R0JRRFRRFRRCCCCJCCCKCKCCCJCCCFRR
RKDROCDRFRCCCDCC"
 290 DATA 3558,"CFRKCCCDCCDROCDR
FRCCCKCCCKCKCCD0CCCKCKCCCPCCCDGG
LCCCC0CCCKCKCCC0CCCCCCCRCCCKCKCC
CJCCCJOJORFP0JKDROCF0RDRN0RNP0R0
FORCCCCJCCCKCKCC"
 300 DATA 5072,"CJCCFRFRORFP0JCC
CDCCRLKF00JRCR0CRKRRF00CCCCJCCCK
CKCCD0CCCKCKCCCJCCCFRKJRDROCROCR
OCCFRKJ0DROCROCRCCCCJCCCKCKCCCJ
CCCFRKCCCDCCDROC"
 310 DATA 3960,"F0DRKCCFRKCCCDCC
DROCF0DRKCCCCJCCCKCKCCD0CCCKCKCC
C0CCG0IOCCC0CCCKCKCCC0CCDCCCCROC
CKCKCCCJCCCJOR0RFPRJKFR0CF0RFRN0
RNP0RRF0RCCCCJCC"
 320 DATA 4138,"CKCKCCCJCCC0DRKR
FP0JCCCDCCRLKF00F0CJOCRK0F00CCC
CJCCCKCKCCD0CCCKCKCCCJCCCFRKFRDR
OCJ0DRKCCFRKF0DROCJ0DRKCCCCJCCCK
CKCCCJCCCFRKCCCD"
 330 DATA 3805,"CCDROCROCROCCFRK
CCCDCCDROCROCROCCCCJCCCKCKCCD0CC
CKCKCCC0CCHECCCC0CCCKCKCCC0CCEC
CCCRCCCKCKCCCJCCCFL0RJFKRFCFJICD
0IJLLOJDP0JDD0IC"
 340 DATA 52,"CCCJCCCKCKCCDPCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCC"
```



Listing 2. PIXFIX Basic enter this listing and RUN 2980 to load the code from listing 1.

note: UP, RIGHT, LEFT, and DOWN pointing arrows are user defined graphics. Where they occur, use graphic D,E,F,G respectively.

```
 5 REM

    ➡ PIX FIX ⬅

  BY John T. Nguyen

 10 LET ST=1: GO TO 3015
 40 POKE 23658,0: POKE 37295,1:
 LET A=8: RANDOMIZE USR 37334: P
OKE 23624,56: RETURN
 50 POKE 37062,SR: REM ROW/PIX
 55 POKE 37066,SC: REM COL/PIX
 60 RANDOMIZE USR 37061
 70 IF NOT PR THEN GO TO 114
 113 INPUT "": PRINT #0;"   ROW:
 ";SR+GR;"   COLUMN: ";SC+GC
 114 POKE (22528+32*GR+GC),36
 115 REM
 116 REM --- BIG PIX MODE ---
 117 LET K$=INKEY$: IF K$="" THE
N GO TO 117
 118 POKE (22528+32*GR+GC),56
 120 GO SUB 390
 127 IF K$<"a" THEN GO TO 50
 130 IF K$="d" THEN LET FL=0: BO
RDER 7
 132 IF K$="s" THEN LET FL=17: B
ORDER 5
 134 IF K$="a" THEN LET FL=14: B
ORDER 0
 135 IF K$="p" THEN LET PR=1*(PR
=0): BEEP .1,10: BEEP .1,15: INP
UT "": IF NOT PR THEN RANDOMIZE
USR 37334: GO TO 50
 140 IF K$="u" THEN GO TO 300
 150 IF K$="i" THEN LET GR=GR-1:
 IF GR<0 THEN LET GR=23
 160 IF K$="j" THEN LET GC=GC-1:
 IF GC<0 THEN LET GC=31
 170 IF K$="k" THEN LET GR=GR+1:
 IF GR>23 THEN LET GR=0
 180 IF K$="l" THEN LET GC=GC+1:
 IF GC>31 THEN LET GC=0
 185 IF K$="o" THEN RANDOMIZE US
R 37237: GO TO 50
 186 IF K$="m" THEN GO SUB 40: G
O TO 800
 187 IF K$="h" THEN GO SUB 40: G
O TO 849
 190 IF NOT FL THEN GO TO 70
 200 POKE 36972,FL: POKE 37150,(
SC+GC): POKE 37151,(SR+GR): RAND
OMIZE USR 37149
 210 POKE 37164,GC: POKE 37165,G
R: RANDOMIZE USR 37163
 215 IF GC<4 AND GR<3 THEN GO TO
 70
 220 POKE 37174,(GC*8): POKE 371
75,(GR*8): POKE 37177,133+8*(FL=
17): RANDOMIZE USR 37173: GO TO
70
 290 REM --- SCREEN MODE ---
 300 RANDOMIZE USR 37183: POKE 3
6972,21: GO SUB 314
 301 LET K$=INKEY$: IF K$="" THE
N GO TO 301
 302 IF K$="u" THEN GO SUB 40: G
O TO 50
 303 IF K$="o" THEN RANDOMIZE US
R 37237: GO TO 300
 304 IF K$="p" THEN GO SUB 314:
COPY : GO SUB 314
 305 IF K$="m" THEN GO TO 820
 306 IF K$="y" THEN RANDOMIZE US
R 37415: GO TO 301
 307 IF K$="h" THEN GO SUB 40: G
O TO 849
 308 IF K$<"a" THEN LET A=8: GO
TO 311
 309 LET K$=CHR$ (CODE K$-32): L
ET A=1
 311 GO SUB 314: GO SUB 390: GO
SUB 314: GO TO 301
 312 REM
 313 REM --- BOX ROUTINE ---
 314 LET BC=SC-1: LET BR=SR-1: L
ET EC=SC+32: LET ER=SR+24
 315 IF BC<0 OR EC>255 THEN POKE
 37196,33: GO TO 330
 320 POKE 37196,34
 330 IF BC<0 THEN POKE 37198,0:
GO TO 340
 335 POKE 37198,BC
 340 IF BR>=0 THEN POKE 37199,BR
: RANDOMIZE USR 37195
 345 IF ER<=255 THEN POKE 37199,
ER: RANDOMIZE USR 37195
 350 IF BR<0 OR ER>191 THEN POKE
 37217,25: GO TO 360
 355 POKE 37217,26
 360 IF BR<0 THEN POKE 37220,0:
GO TO 370
 365 POKE 37220,BR
 370 IF EC<=255 THEN POKE 37219,
EC: RANDOMIZE USR 37216
 375 IF BC>=0 THEN POKE 37219,BC
: RANDOMIZE USR 37216
 380 RETURN
 388 REM --- GET KEY ---
 390 IF K$="I" THEN LET SR=SR-A:
 IF SR<0 THEN BEEP .1,8: LET SR=
0
 395 IF K$="J" THEN LET SC=SC-A:
 IF SC<0 THEN BEEP .1,8: LET SC=
0
 400 IF K$="K" THEN LET SR=SR+A:
 IF SR>168 THEN BEEP .1,8: LET S
R=168
 405 IF K$="L" THEN LET SC=SC+A:
 IF SC>224 THEN BEEP .1,8: LET S
C=224
 410 RETURN
 790 REM --- MENU ---
 820 GO SUB 1020: PRINT AT 10,6;
"PRESS :"'TAB 6;"➡ M - FOR THIS
 SCREEN"'TAB 6;"➡ H - FOR HELP S
CREENS"'TAB 6;"➡ C - TO CREATE P
ICTURE"'TAB 6;"➡ L - TO LOAD PIC
TURE"'TAB 6;"➡ S - TO SAVE PICTU
RE"
 823 PRINT TAB 6;"➡ X - TO CLEAR
 PICTURE"'TAB 6;"➡ P - TO COPY T
O PRINTER"'TAB 6;"➡ Q - TO QUIT"
: GO SUB 999: PRINT AT 9,13;" ME
NU "
 824 INPUT "": PRINT #0;"  PICK
OPTION OR PRESS <ENTER>"
 825 LET K$=INKEY$: IF K$="" THE
N GO TO 825
 830 IF K$="h" THEN INPUT "": GO
 SUB 997: GO TO 850
 831 IF K$="c" THEN GO TO 2000
 832 IF K$="s" THEN IF ST THEN G
O SUB 997: GO TO 1040
 834 IF K$="l" THEN GO SUB 1450:
 CLS : GO TO 820
 836 IF K$="p" THEN CLS : RANDOM
IZE USR 37183: COPY : GO TO 820
 837 IF K$="x" THEN INPUT "": PR
INT #0;"          ARE YOU SURE? (Y/
N)": GO SUB 990: GO TO 824
 839 IF K$="q" THEN CLS : POKE 2
3692,25: PRINT AT 21,0;"* TYPE (
GO TO 1) TO CONTINUE OR   VARIAB
LES WILL BE CLEARED FROM  MEMORY
.": FOR J=1 TO 19: PRINT : NEXT
J: STOP
```

Listing 2.(cont.)

```
 840 IF K$=CHR$ 13 THEN IF ST TH
EN GO SUB 40: GO TO 50
 846 GO TO 825
 847 REM
 848 REM --- HELP SCREENS ---
 849 GO SUB 1020
 850 PRINT AT 10,1;"<ARROW>"'TAB
 2;"KEYS    IN BIG PIX MODE :"'"
'"    ↑      HOLD DOWN <CAPS SHIFT>"
'"    I    & <ARROW> KEYS TO MOV
E"'"  ←J L→  ENTIRE SCREEN."'"
  K"'"    ↓      USE <ARROW> KEYS
ALONE"'TAB 9;"TO MOVE CURSOR."
 852 PRINT 'TAB 25;"Page 1"'#0;"
   PRESS ANY KEY TO CONTINUE": P
LOT 67,100: DRAW 0,-96: PLOT 74,
78: DRAW 116,0
 860 GO SUB 999: PRINT AT 9,14;"
HELP ": PAUSE 0: GO SUB 997
 862 PRINT AT 11,5;"PRESS :"'TA
B 5;"→ A - FOR DRAW MODE"'TAB 5;
"→ S - FOR ERASE MODE"'TAB 5;"→
D - FOR NEUTRAL MODE"'TAB 5;"→ P
 - TO PRINT ROW/COLUMN"'TAB 5;"→
 O - TO INVERT SCREEN"
 864 PRINT TAB 5;"→ U - FOR SCRE
EN MODE"'TAB 25;"Page 2"
 866 GO SUB 999: PRINT AT 9,14;"
HELP ": PAUSE 0: GO SUB 997: IN
PUT ""
 870 PRINT AT 10,1;"<ARROW>"'TAB
 2;"KEYS    IN SCREEN MODE :"'"
  ↑"'"    I    <ARROW> KEYS"'"
←J L→   → MOVE BOX (STEP 1)"'"
  K    <ARROW> & <CAPS>"'"
   → MOVE BOX (STEP 8)"      ↓
 871 PRINT '"    PRESS: Y - FOR A
TTRIBUTES"'TAB 10;"U - FOR BIG P
IX MODE"
 873 PRINT TAB 25;"Page 3": PLOT
 67,100: DRAW 0,-65: DRAW -67,0:
 PLOT 74,78: DRAW 108,0
 875 GO SUB 999: PRINT AT 9,14;"
 HELP "'#0;" PRESS <M> FOR MENU
OR <ENTER>": PAUSE 0
 877 LET K$=INKEY$: IF K$="" THE
N GO TO 877
 878 IF K$="m" THEN CLS : GO TO
820
 879 IF K$=CHR$ 13 THEN IF ST TH
EN GO SUB 40: GO TO 50
 885 GO TO 877
 980 REM ------
 990 IF INKEY$="y" THEN RANDOMIZ
E USR 37253: INPUT "": PRINT #0;
TAB 13;"DONE": PAUSE 90: RETURN
 991 IF INKEY$="n" THEN RETURN
 992 GO TO 990
 996 REM ------
 997 FOR J=9 TO 21: PRINT AT J,0
;"
  ": NEXT J: RETURN
 998 REM ------
 999 PLOT 0,100: DRAW 255,0: DRA
W 0,-97: DRAW -255,0: DRAW 0,97:
 RETURN
1010 REM ------
1020 CLS : BORDER 7: LET FL=0: R
ANDOMIZE USR 37349: PLOT 4,108:
INK 7: DRAW 0,3: PLOT 5,107: DRA
W 246,0: PLOT 252,108: DRAW 0,3:
 RANDOMIZE USR 37268: PLOT 252,1
12: INK 0: POKE 37295,1: RETURN
1030 REM --- SAVE PICTURE ---
1040 PRINT AT 11,3;"PRESS :"'"
  → S - TO SAVE AS A SCREEN$ "'"
"    → L - TO SAVE FROM MEMORY"
1043 GO SUB 999: PRINT AT 9,13;"
 SAVE "
1045 LET K$=INKEY$: IF K$<>"s" A
ND K$<>"l" AND K$<>CHR$ 13 THEN
GO TO 1045
1047 IF K$=CHR$ 13 THEN GO TO 82
0
1050 IF K$="l" THEN GO TO 1070
1053 FOR J=15 TO 11 STEP -1: PRI
NT AT J+1,3;"
                "'AT J,3;"→    SAVE AS
A SCREEN$      ": PAUSE 5: NEXT J
1055 INPUT "BORDER COLOR? (0-7):
"; LINE B$: IF B$="" THEN GO TO
 820
1057 IF B$<"0" OR B$>"7" THEN GO
 TO 1055
1060 BORDER VAL B$: CLS : RANDOM
IZE USR 37183: RANDOMIZE USR 374
15: SAVE N$SCREEN$ : GO SUB 40:
CLS : GO TO 820
1070 FOR J=15 TO 11 STEP -1: PRI
NT AT J+1,3;"
                "'AT J,3;"→    SAVE FRO
M MEMORY       ": PAUSE 5: NEXT J
1075 PRINT AT 13,4;"PRESS :"'"
  → 1 - TO SAVE 1/3 OF SCREEN"'"
  → 2 - TO SAVE 2/3 OF SCREEN"'"
  → 3 - TO SAVE ALL OF SCREEN"
1080 PLOT 0,60: DRAW 0,-50
1085 LET K$=INKEY$: IF K$<>"1" A
ND K$<>"2" AND K$<>"3" AND K$<>C
HR$ 13 THEN GO TO 1085
1088 IF K$=CHR$ 13 THEN GO TO 82
0
1090 INPUT "": SAVE N$CODE 50000
,2048+VAL K$
1120 INPUT "": PRINT #0;"      V
ERIFY CODES? (Y/N)"
1125 GO SUB 1400: IF INKEY$="n"
THEN GO TO 820
1145 PRINT '"* VERIFYING :"'"   "
"";N$;""" CODE 50000,";2048+VAL
K$: VERIFY N$CODE : PRINT ' FLAS
H 1;"TURN OFF RECORDER": PAUSE 6
0: GO TO 820
1200 GO TO 1045
1400 REM --- VERIFY ---
1405 INPUT "": PRINT #0;"      V
ERIFY CODES? (Y/N)"
1410 IF INKEY$<>"y" AND INKEY$<>
"n" THEN GO TO 1410
1425 IF INKEY$="n" THEN RETURN
1430 CLS : PRINT "* REWIND TAPE
AND PRESS PLAY TO   VERIFY"'
1435 IF IN 254<>95 THEN GO TO 14
35
1440 RETURN
1450 REM --- LOAD ---
1460 CLS : PRINT "* ENTER NAME O
F PICTURE.": INPUT N$
1465 IF N$="" THEN RETURN
1470 LET ST=1: PRINT '"* PRESS P
LAY ON RECORDER.": GO SUB 1435:
PRINT '"* LOADING :"'"   """;N$;"
"" CODE 50000": LOAD N$CODE 5000
0: PRINT ' FLASH 1;"TURN OFF REC
ORDER": PAUSE 120: GO SUB 40: GO
 TO 50
1980 REM ------
2000 INPUT "NAME OF PICTURE? ";N
$: IF N$="" THEN GO TO 2000
2005 IF LEN N$>10 THEN GO TO 200
0
2010 LET ST=1: GO SUB 40: GO TO
50
2970 REM
2980 REM --- PROGRAM STARTS
             HERE.
2990 CLEAR 36911: LOAD "pix.code
"CODE 36912: CLS : PRINT AT 11,7
; FLASH 1;"TURN OFF RECORDER": P
AUSE 120
3000 LET N=47661: FOR J=1 TO 30:
 POKE (N+J),7: POKE (N+32+J),7:
POKE (N+64+J),7: POKE (N+96+J),7
: POKE (N+128+J),4: POKE (N+160+
J),4
3005 POKE (N+192+J),5: POKE (N+2
24+J),5: POKE (N+256+J),7: NEXT
J
3010 FOR J=0 TO 8: POKE (N+J*32)
,7: POKE (N+J*32+31),7: NEXT J
3013 LET N$="PICTURE": POKE 3729
5,0: LET ST=0
3015 POKE 23728,51: POKE 23729,1
46: RANDOMIZE USR 37361
3020 POKE 23658,0: LET FL=0: LET
 SR=87: LET SC=121: LET GR=11: L
ET GC=16: LET PR=0
3023 POKE 23658,0: POKE 23675,13
3: POKE 23676,144
3030 GO TO 820
9960 REM
9970 REM --- SAVE ROUTINE ---
9999 SAVE "pix fix" LINE 2990: S
AVE "pix.code"CODE 36912,1544: C
LS : PRINT "* REWIND TAPE AND PR
ESS PLAY TO   VERIFY.": VERIFY "
pix fix": VERIFY ""CODE
```

HIGH RESOLUTION STRIP CHARTS FOR THE ZX81 by Jim Pitts

This program will allow you to print out high resolution strip chart representations of data stored in the memory of a ZX81 or TS1000 computer. Other strip chart programs exist for these inexpensive computers but these allow only a resolution of 32 or 64 pixels. When combined with the 2040 printer "STRIP" will provide a resolution of 255 pixels, which allows complete resolution of a single data byte as collected from an 8 bit analog to digital convertor.

In my system data is stored in a non-volatile 8k memory chip, the CMOS 6264LP-12, mapped to the protected 8k memory block above ROM. This is an easy to implement modification but is not necessary for use with the "STRIP" program. The popular Hunter Board also uses this area of memory for non-volatile storage. See July and August '83 Radio-Electronics for details on the Hunter Board. You may find it more convenient to store data above RAMTOP or even in an array. The basic driver shown in Fig.1 can be totally re-written to suit your needs by noting the following addresses in the machine code portion of the program.

```
TABLE  begins at 16516  (32 bytes long)
TICS   16549  interval between timing markers
BOTM   16550 & 16551  memory address of beginning of data file
TOP    16552 & 16553  memory address of top of data file
START  16556   USR call here to print the chart
```

The 32 byte table represents the 256 bits of the chart from bottom to top. By poking the appropriate code in this table you can modify the number of horizontal amplitude lines on the chart. For example, the bottom line of the chart is invoked by an 80h (10000000b) written into the first byte of the TABLE. Left as-is the program draws a bottom, mid-point, and top line.

A disassembly of the machine code portion of the program is shown in Fig.2. This routine is poked into a 1 REM line which first typed into the computer using any 223 characters after the REM token. The listing in Fig.3 lists the bytes to be poked in decimal and in hex for anyone who has a hex loader they would like to use. If you do not have a loader program already on tape, type in the following lines, run it, poke the appropriate byte when prompted, then delete all but the 1 REM which now contains the machine code routine.

```
2 FOR I=1 TO 223
3 PRINT I;"  "
4 INPUT A
5 POKE 16513+I,A
6 PRINT 16513+I;"  ";A
7 SCROLL
8 NEXT I
9 STOP
( Don't forget to type the long 1 REM statement first! )
```

You may then proceed to type in your basic driver.
Comments and questions regarding the program are welcome.

OVER

FIG 3

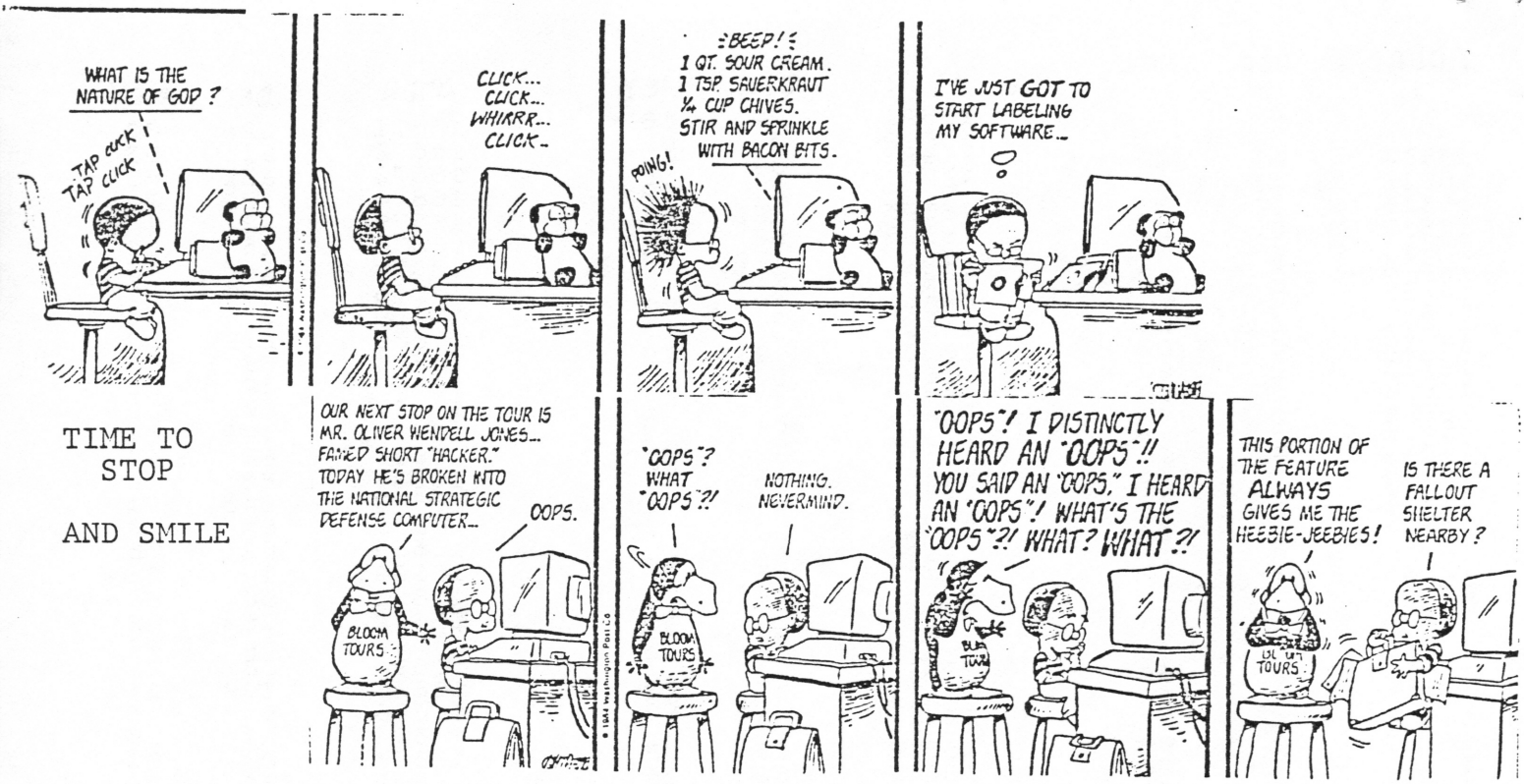
ADDR.	DEC.	HEX
16514	45	2D
16515	46	2E
16516	128	80
16517	0	00
16518	0	00
16519	0	00
16520	0	00
16521	0	00
16522	0	00
16523	0	00
16524	0	00
16525	0	00
16526	0	00
16527	0	00
16528	0	00
16529	0	00
16530	0	00
16531	0	00
16532	128	80
16533	0	00
16534	0	00
16535	0	00
16536	0	00
16537	0	00
16538	0	00
16539	0	00
16540	0	00
16541	0	00
16542	0	00
16543	0	00
16544	0	00
16545	0	00
16546	0	00
16547	1	01
16548	0	00
16549	15	0F
16550	0	00
16551	32	20
16552	254	FE
16553	32	20
16554	0	00
16555	0	00
16556	205	CD
16557	231	E7
16558	2	02
16559	175	AF
16560	211	D3
16561	251	FB
16562	42	2A
16563	166	A6
16564	64	40
16565	126	7E
16566	230	E6
16567	33	21
16568	132	84
16569	64	40
16570	14	0E
16571	0	00
16572	6	06
16573	128	80
16574	254	FE
16575	0	00
16576	40	28
16577	13	0D
16578	61	3D
16579	40	28
16580	10	0A
16581	167	A7
16582	200	C8
16583	24	18
16584	48	30
16585	248	F8
16586	12	0C
16587	6	06
16588	128	80
16589	24	18
16590	243	F3

ADDR.	DEC.	HEX
16591	22	16
16592	0	00
16593	89	59
16594	25	19
16595	126	7E
16596	50	32
16597	170	AA
16598	64	40
16599	176	B0
16600	119	77
16601	121	79
16602	50	32
16603	171	AB
16604	64	40
16605	58	3A
16606	164	A4
16607	64	40
16608	71	47
16609	60	3C
16610	50	32
16611	164	A4
16612	64	40
16613	58	3A
16614	165	A5
16615	64	40
16616	164	A4
16617	32	20
16618	15	0F
16619	62	3E
16620	255	FF
16621	50	32
16622	132	84
16623	64	40
16624	50	32
16625	148	94
16626	64	40
16627	50	32
16628	163	A3
16629	64	40
16630	175	AF
16631	50	32
16632	164	A4
16633	64	40
16634	205	CD
16635	70	46
16636	15	0F
16637	56	38
16638	5	05
16639	31	1F
16640	211	D3
16641	251	FB
16642	201	C9
16643	12	0C
16644	219	DB
16645	251	FB
16646	15	0F
16647	200	C8
16648	33	21
16649	65	41
16650	48	30
16651	38	26
16652	5	05
16653	32	20
16654	33	21
16655	131	83
16656	64	40
16657	197	C5
16658	6	06
16659	6	06
16660	35	23
16661	126	7E
16662	245	F5
16663	219	DB
16664	251	FB
16665	31	1F
16666	48	30
16667	251	FB
16668	241	F1
16669	87	57
16670	230	E6

ADDR	DEC.	HEX
16671	128	80
16672	211	D3
16673	251	FB
16674	122	7A
16675	23	17
16676	16	10
16677	240	F0
16678	193	C1
16679	16	10
16680	232	E8
16681	62	3E
16682	12	0C
16683	50	32
16684	132	84
16685	64	40
16686	50	32
16687	148	94
16688	64	40
16689	62	3E
16690	1	01
16691	50	32
16692	163	A3
16693	64	40
16694	33	21
16695	132	84
16696	64	40
16697	22	16
16698	0	00
16699	58	3A
16700	171	AB
16701	64	40
16702	95	5F
16703	58	3A
16704	170	AA
16705	64	40
16706	25	19
16707	119	77
16708	237	ED
16709	91	5B
16710	168	A8
16711	64	40
16712	225	E1
16713	35	23
16714	229	E5
16715	237	ED
16716	82	52
16717	48	30
16718	4	04
16719	225	E1
16720	195	C3
16721	181	B5
16722	64	40
16723	225	E1
16724	201	C9
16725	201	C9
16726	31	1F
16727	48	30
16728	251	FB
16729	62	3E
16730	4	04
16731	211	D3
16732	251	FB
16733	205	CD
16734	7	07
16735	2	02
16736	201	C9

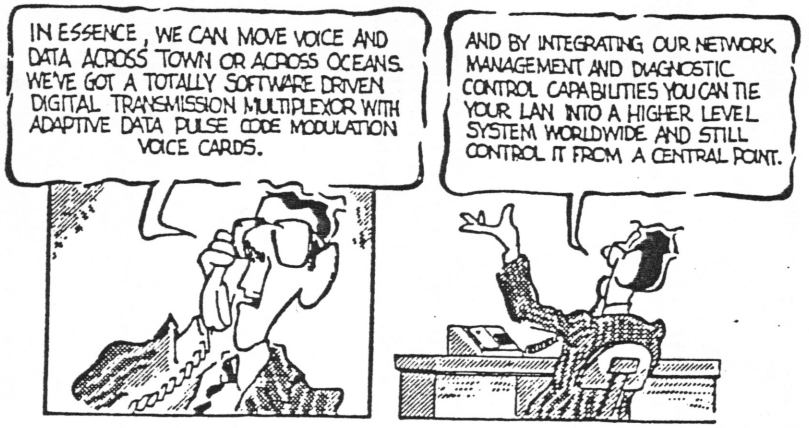
THESE BYTES MUST BE ENTERED IN THE 223 BYTE 1 REM LINE

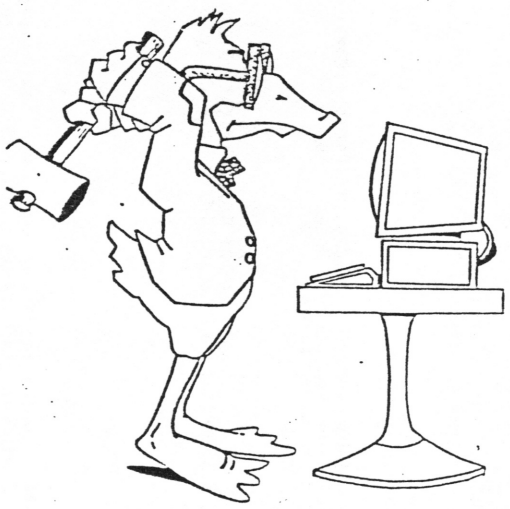
BLOOM COUNTY

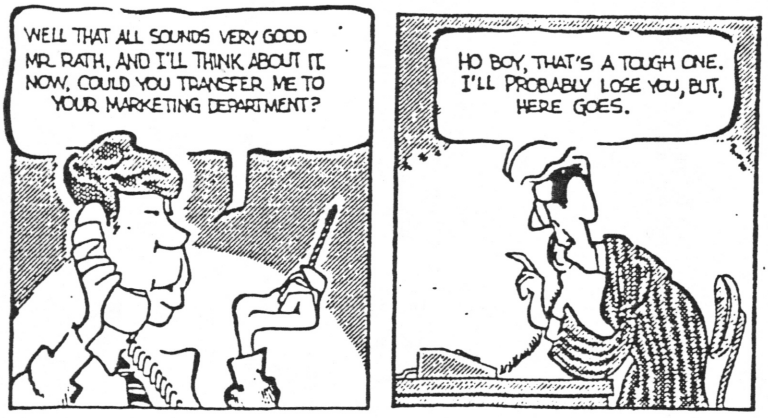

WHAT IS THE NATURE OF GOD ?
TAP CLICK TAP CLICK
CLICK... CLICK... WHIRRR... CLICK...
:BEEP!:
1 QT. SOUR CREAM. 1 TSP. SAUERKRAUT ¼ CUP CHIVES. STIR AND SPRINKLE WITH BACON BITS.
PONG!
I'VE JUST GOT TO START LABELING MY SOFTWARE...
TIME TO STOP
AND SMILE
OUR NEXT STOP ON THE TOUR IS MR. OLIVER WENDELL JONES... FAMED SHORT "HACKER." TODAY HE'S BROKEN INTO THE NATIONAL STRATEGIC DEFENSE COMPUTER...
OOPS.
BLOOM TOURS
"OOPS"? WHAT "OOPS"?!
NOTHING. NEVERMIND.
"OOPS"! I DISTINCTLY HEARD AN "OOPS"!! YOU SAID AN "OOPS," I HEARD AN "OOPS"! WHAT'S THE "OOPS"?! WHAT? WHAT?!
THIS PORTION OF THE FEATURE ALWAYS GIVES ME THE HEEBIE-JEEBIES!
IS THERE A FALLOUT SHELTER NEARBY?

dB

BY RICH TENNANT


IN ESSENCE, WE CAN MOVE VOICE AND DATA ACROSS TOWN OR ACROSS OCEANS. WE'VE GOT A TOTALLY SOFTWARE DRIVEN DIGITAL TRANSMISSION MULTIPLEXOR WITH ADAPTIVE DATA PULSE CODE MODULATION VOICE CARDS.
AND BY INTEGRATING OUR NETWORK MANAGEMENT AND DIAGNOSTIC CONTROL CAPABILITIES YOU CAN TIE YOUR LAN INTO A HIGHER LEVEL SYSTEM WORLDWIDE AND STILL CONTROL IT FROM A CENTRAL POINT.




WELL THAT ALL SOUNDS VERY GOOD MR. RATH, AND I'LL THINK ABOUT IT NOW, COULD YOU TRANSFER ME TO YOUR MARKETING DEPARTMENT?
HO BOY, THAT'S A TOUGH ONE. I'LL PROBABLY LOSE YOU, BUT, HERE GOES.

"HIT ANY KEY TO CONTINUE"

HIGH RESOLUTION STRIP CHARTS FOR THE ZX81

fig. 1

```
    1 REM HI
          = 4 COPY 4  LN SCROL
L  PEEK CLS E RND  RETURN  0=
XO 8AC8 /K SAVE £ / NEXT - ?:?M
 NDURND?UM RNDU RND 4?Y COPY M
 NDMRNDM RNDEMRNDLN ??8 PEEK
 CLS INT £<= CLS  = IF ?INKEY$K I
NPUT "45 NDVAL "7 CLS LET ? NE
U PEEK CLS ?=( LIST AT ( CONT Y
 NDMRNDY MRNDSRND- URND?U
ND;? GOSUB ?RND LPRINT 7 PEE
 GOSUB ?0 LPRINT ?RND LPRINT <
= CLS 3K CLS Y PEEK CLS LN TAN
 ?W?
    5 REM BY JIM PITTS
    6 REM S.A.R.A. MEMBER
    7 REM 1434 GODDARD AVE.
    8 REM LOUISVILLE,KY 40204
   60 REM IF YOU INTEND TO STORE
          DATA FILE ABOVE RAMTOP,
   61 REM YOU MUST FIRST LOWER
          RAMTOP BY POKING THE
   62 REM APPROPRIATE VALUES TO
          16388 AND 16389.
  100 PRINT "
"
  110 PRINT AT 4,0;"FILE START =
";
  120 INPUT S
  130 PRINT S
  140 PRINT AT 6,0;"FILE END = ";
  150 INPUT END
  160 PRINT END
  170 PRINT AT 8,0;"TIC INCREMENT
= ";
  180 INPUT T
  190 IF T>255 THEN GOTO 170
  200 PRINT T
  210 PRINT AT 10,0;"FILE NAME =
";
  220 INPUT F$
  230 PRINT F$
  240 PRINT 12,0;"NOTES:"
  250 COPY
  260 POKE 16550,S-INT (S/256)
  270 POKE 16551,INT (S/256)
  280 POKE 16552,END-INT (END/256
)
  290 PRINT 16553,INT (END/256)
  300 RAND USR 16514
  310 STOP
  900 PAUSE 400
  990 REM EXAMPLE OF DATA
          COLLECTION ROUTINE
  992 REM USING 8K REGION ABOVE
          THE ROM.
  994 REM DIGITAL TO ANALOG
          CONVERTOR AT 14336
 1000 FOR I=8192 TO 8448
 1005 POKE 14336,0
 1010 POKE I,PEEK 14336
 1030 NEXT I
```

```
                    2040 POINTED STRIP CHARTS

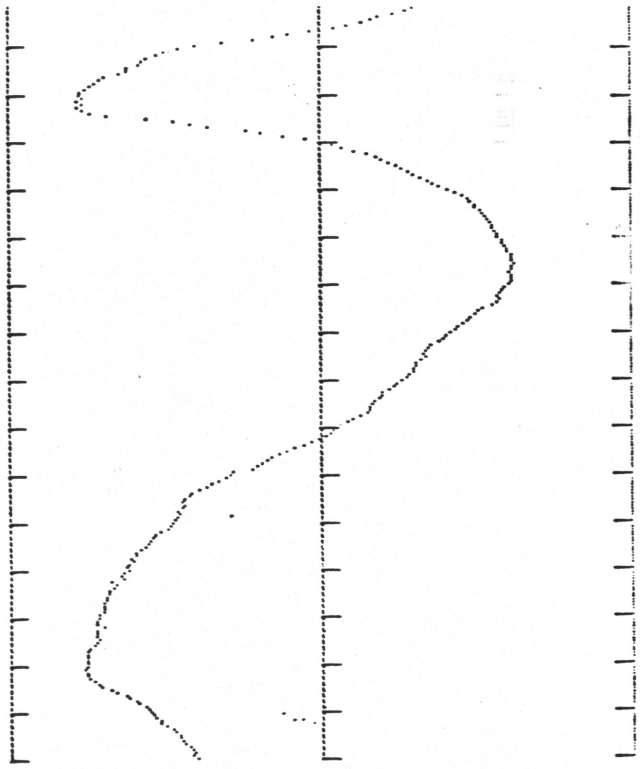
FILE START = 8192

FILE END = 8448

TIC INCREMENT = 15

FILE NAME = TEST PLOT 0

NOTES:
```



CONT.

fig. 2

```
TABLE 80 00 00 00 00 00 ;PIXEL
      00 00 00 00 00 00 ;LINE
      00 00 00 00       ;DATA
TBL2  80 00 00 00 00 00
      00 00 00 00 00 00
      00 00 00 01
TICNO 00
TICS  0A     ;INTERVAL FOR TICS
BOTM  00 20 ;START OF DATA FILE
TOP   FF 20 ;TOP OF DATA FILE
SAVE  00     ;STORE HORIZ LINES
SAVE2 00
START CALL 02E7    ;CALL FAST
      XOR A
      OUT FE,A     ;START MOTOR
      LD HL,(BOTM)
LINE  LD A,(HL)    ;CALC POS. OF
      PUSH HL      ;PIXEL IN
      LD HL,TABLE ;TABLE FROM
      LD C,00      ;BYTE TAKEN
      LD B,80      ;FROM FILE
      OR 00
      JR Z,POINT
TEST  DEC A
      JR Z,POINT
      AND A
      RR B
      JR NC,TEST
      INC C
      LD B,80
      JR TEST
POINT LD D,00
      LD E,C
      ADD HL,DE
      LD A,(HL) ;LOAD BYTE IN
      LD (SAVE),A ;TABLE AND
      OR B         ;SAVE HORIZ
      LD (HL),A    ;LINE IF ANY
      LD A,C
      LD (SAVE2),A
      LD A,(TICNO) ;TIME FOR A
      LD B,A       ;TIC?
      INC A
      LD (TICNO),A
      LD A,(TICS)
      CP B
      JR NZ,BRK    ;IF NO SKIP
      LD A,FF
      LD (TABLE),A ;LOAD TICS
      LD (TBL2),A
      LD (TICNO-1),A
      XOR A
      LD (TICNO),A
BRK   CALL 0F48 ;CHECK FOR
      JR C,CONT ;BREAK KEY
      RRA
      OUT FE,A
      RST 08     ;ERROR IF BRK
      0C
CONT  IN A,FE
      ADD A,A
      JP M,ENDIT
      JR NC,BRK
      LD E,20
      LD HL,TABLE-1
NXTSY PUSH BC    ;SEND OUT
      LD E,08    ;PIXEL LINE TO
      INC HL     ;PRINTER
      LD A,(HL)
AGN1  PUSH AF
WAIT  IN A,FE
      RRA
      JR NC,WAIT
      POP AF
      LD D,A
      AND +128
      OUT FE,A
      LD A,D
      RLA
      DJNZ AGN1
      POP BC
      DJNZ NXTSY
      LD A,80      ;RESTORE ALL
      LD (TABLE),A ;LINES
      LD (TBL2),A ;WHERE TICS
      LD A,01      ;WERE PLACED
      LD (TICNO-1),A
      LD HL,TABLE
      LD D,00
      LD A,(SAVE2)
      LD E,A
      LD A,(SAVE)
      ADD HL,DE ;RESTORE ALL
      LD (HL),A ;HORIZ LINES
      LD DE,(TOP)
      POP HL
      INC HL
      PUSH HL
      SBC HL,DE ;DONE WITH DATA
      JR Z,ENDIT ;FILE?
      POP HL
      JP LINE ;NO,THEN DO MORE
ENDIT POP HL
END2  IN A,FE ;TURN OFF MOTOR
      RRA
      JR NC,END2
      LD A,04
      OUT FE,A
      CALL 0207 ;CALL SLOW
      RET       ;RETURN TO
                ;BASIC

          END
```

BATTLESHIP

TS/2068

This is the classic game you played with pencil and graph-paper with a friend. With this program the computer is your adversary. Each player has

1 BATTLESHIP
2 DESTROYERS
3 FRIGATES

A Battleship consists of four squares,. Destroyers three, and Frigates are two squares.

When the computer asks you to enter your ships, enter the coordinates that you want the bow of the ship, and R if it is to be to the right, or horizontal or U for up or vertical > F5R . When entering your shots just enter the letter and the number of the coordinates for each shot > D5 .

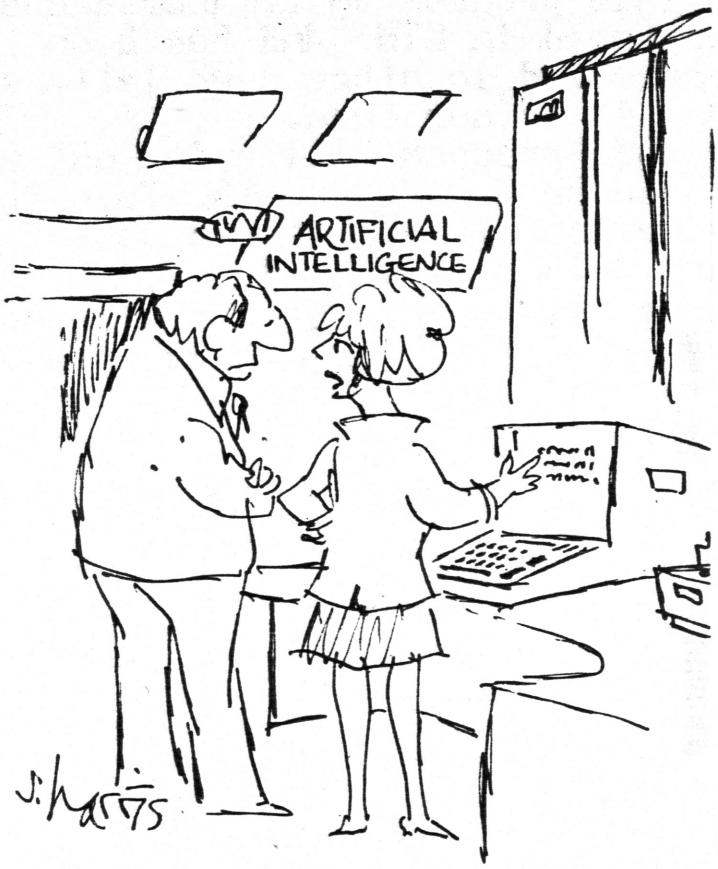
You and the computer each start with five shots, but this will diminish to two each. Who ever sinks the the opposing fleet, or 16 points wins.

```
 10 REM COMPUTER BATTLESHIPS´by
A. Pratt
 50 REM Initialize variables
 60 LET a=0: LET b=1: LET d=2:
LET e=7: RANDOMIZE
 70 BORDER e: PAPER e: INK a: B
RIGHT a: CLS
 80 DIM b$(20): DIM w$(b): DIM
n$(6): DIM i$(17): DIM j$(32)
 90 DIM h(3): DIM g(3): DIM y(8
): DIM x(8)
 100 LET n$="BDDFFF"
 110 LET b$="0123456789ABCDEFGHI
J"
 120 FOR i=b TO 3: READ h(i): LE
T g(i)=h(i): NEXT i
 130 DATA 4,6,6
 140 FOR i=b TO 8: READ y(i): RE
AD x(i): NEXT i
 150 DATA -b,a,-b,b,a,b,b,b,b,a,
b,-b,a,-b,-b,-b
 160 REM #### Instructions ####
 180 PRINT BRIGHT b; AT a,a;"
    COMPUTER BATTLESHIPS    "
 190 PRINT '"Battleships is play
ed on a boardof 10 by 10 squares
 on which aresited 1 Battleship,
 2 Destroyersand 3 Frigates."
 200 PRINT '"Each ship is repres
ented by a  horizontal or verti
cal line of  4*B, 3*D or 2*F. No
 two ships  are allowed to touc
h each other in any direction."
 210 PRINT '"The object is to lo
cate and sinkthe computer's ship
s before it sinks yours. A scor
e of 16 wins."
 220 PRINT '"Locations are refe
red to by co- ordinates and are
 chosen by  pressing the lette
r followed by the number."
 230 PRINT BRIGHT b;"  Press an
y key to continue  "
 240 PAUSE a
 250 REM Start of screen setup
 260 FOR i=b TO 21: PRINT AT i,a
;j$: NEXT i
 270 PLOT d,34: DRAW a,131: DRAW
 251,a: DRAW a,-131: DRAW -251,a
 280 FOR i=5 TO 133 STEP 128
 290 PLOT i,37: DRAW a,125: DRAW
 117,a: DRAW a,-125: DRAW -117,a

 300 NEXT i
 310 PRINT  AT d,b;"HUMAN SCORE:
";AT d,17;"COMPU SCORE:"
 320 PRINT AT 4,3;"ABCDEFGHIJ";A
T 4,19;"ABCDEFGHIJ"
 330 FOR i=a TO 9
 340 PRINT AT 6+i,b;i;AT 6+i,17;
i: NEXT i
 400 REM ** Sets up the boards *
 410 PAPER 4: INK 4: FOR i=d TO
18 STEP 16: PRINT AT 5,i;"XXXXXX
XXXXXX";AT 16,i;"XXXXXXXXXXXX"
 420 NEXT i
 430 FOR i=6 TO 15
 440 PRINT AT i,d;"X";AT i,13;"X
";AT i,18;"X";AT i,29;"X"
 450 FOR j=3 TO 12: LET k=(i+j)/
d
 460 PRINT PAPER e; BRIGHT ((k-I
NT (k))*d);AT i,j;" ";AT i,j+16;
" ": NEXT j
 470 NEXT i: PAPER e: INK a
 600 REM *** Enter the ships ***
 620 BRIGHT b
 630 GO SUB 4000: GO SUB 5000
 640 LET dir=a: LET max=a: LET r
last=a: LET clast=a: LET h=a: LE
T g=a: GO SUB 990
 650 IF RND<.5 THEN GO TO 830
 800 REM *** Main game loop ***
 810 GO SUB 1000: REM Human move
 820 IF h=16 THEN GO SUB 8000: P
RINT AT 19,a;"Human won ";h;" to
";g: STOP
 830 GO SUB 2000: REM Comps move
 840 IF g=16 THEN GO SUB 8000: P
RINT AT 19,a;"Computer won ";g;"
to ";h: STOP
 850 GO TO 810
 980 REM **** Score update ****
 990 PRINT  AT d,13;h;AT d,29;g:
RETURN
1000 REM **** Human's move ****
1010 LET j=6-b*(g(b)<3)-b*(g(d)<
5)-b*(g(d)<3)-b*(g(3)<5)-b*(g(3)
<4)
1020 IF j<d THEN LET j=d
1030 GO SUB 8000: LET pos=b
1050 PRINT AT 18,a;"HUMAN has ";
j;" moves, Enter co-ords"
1060 FOR k=b TO j: LET r=a: LET
c=a: LET pos=pos+4
1090 PRINT AT 21,b;"Move Number
";k; FLASH b;AT 21,16;"?";: PRIN
T " ";
1100 GO SUB 7000: LET c=c+16
1160 PRINT AT 19,pos;b$(c-8);b$(
r-5);AT 21,a;j$
1170 IF ATTR (r,c)=87 THEN PRINT
 INK d;AT 20,pos;"Mad": GO TO 12
90
1180 LET w$=SCREEN$ (r,c)
1200 IF w$=" " THEN GO SUB 6500:
 GO TO 1270
1210 IF w$="B" THEN  LET g(b)=g(
b)-b
1220 IF w$="D" THEN LET g(d)=g(d
)-b
1230 IF w$="F" THEN LET g(3)=g(3
)-b
1240 PRINT  PAPER d; INK e; FLAS
H b;AT r,c;w$: PRINT  AT 20,pos;
"*";w$;"*"
1250 GO SUB 6000
1260 LET h=h+b: GO SUB 990
1270 PRINT  PAPER d; INK e; BRIG
HT b;AT r,c;w$;
1280 IF h=16 THEN RETURN
1290 NEXT k
1300 RETURN
1999 REM
2000 REM *** Computer's move ***
2010 LET j=6-b*(h(b)<3)-b*(h(d)<
5)-b*(h(d)<3)-b*(h(3)<5)-b*(h(3)
<4)
2020 IF j<d THEN LET j=d
2030 GO SUB 8000: LET pos=b
2040 PRINT AT 18,a;"COMPUTER has
 ";j;" moves,"
2050 LET r=rlast: LET c=clast
2060 FOR k=b TO j: LET pos=pos+4
2070 IF dir>a AND max>a THEN GO
TO 2500
2100 REM **** Random choice ****
2110 LET r=INT (RND*10)+6: LET c
=INT  (RND*10)+3
2120 IF ATTR (r,c)=87 OR ATTR (r
,c)=82 THEN GO TO 2110
2150 REM Isolated square check
2160 LET v=a: FOR i=b TO 7 STEP
d
2170 LET attr=ATTR (r+y(i),c+x(i
))
2180 IF attr=87 OR attr=82 OR at
tr=36 THEN LET v=v+.25
2190 NEXT i: IF v=b THEN GO TO 2
110
2200 REM ** Ship close check **
2210 LET v=a: FOR i=b TO 8
2220 IF ATTR (r+y(i),c+x(i))=87
THEN LET v=b
2230 NEXT i: IF v=b THEN GO TO 2
110
2300 GO SUB 3000: LET w$=SCREEN$
 (r,c)
2310 IF w$=" " THEN GO SUB 6500:
 PRINT PAPER d; INK d; BRIGHT b;
AT r,c;"X": GO TO 2410
2320 IF w$="B" THEN LET h(b)=h(b
)-b: LET max=3
2330 IF w$="D" THEN LET h(d)=h(d
)-b: LET max=d
2340 IF w$="F" THEN LET h(3)=h(3
)-b: LET max=b
2350 PRINT  PAPER d; INK e; FLAS
H b; AT r,c;w$: PRINT AT 20,pos;
"*";w$;"*"
2360 GO SUB 6000
2370 LET g=g+b: GO SUB 990
2380 LET dir=b+d*(RND<.5)
2390 PRINT PAPER d; INK e; BRIGH
T b;AT r,c;"*"
2400 IF g=16 THEN RETURN
2410 NEXT k
2420 LET rlast=r: LET clast=c
2430 PAUSE e*e
2490 RETURN
2500 REM *** Search routine ***
2600 LET rt=r+y(dir): LET ct=c+x
(dir)
2610 IF ATTR (rt,ct)=87 THEN LET
 r=rt: LET c=ct: GO TO 2600
2620 IF SCREEN$ (rt,ct)=" " THEN
 LET r1=rt: LET c1=ct: LET dir=d
ir+4-6*(dir=5)-10*(dir=7): GO TO
 2800
2630 IF ATTR (rt,ct)=82 OR ATTR
(rt,ct)=36 THEN LET dir=dir+4-6*
(dir=5)-10*(dir=7): GO TO 2600
2640 IF SCREEN$ (rt,ct)<>" " THE
N LET r1=rt: LET r=rt: LET c1=ct
: LET c=ct: GO TO 2800
2800 REM *** Succesive hits ***
2810 GO SUB 3000: LET w$=SCREEN$
 (r1,c1)
2820 IF w$=" " THEN GO SUB 6500:
 PRINT PAPER d; INK d; BRIGHT b;
AT r1,c1;"X": GO TO 2400
2830 IF w$="B" THEN LET h(b)=h(b
)-b
2840 IF w$="D" THEN LET h(d)=h(d
)-b
2850 IF w$="F" THEN LET h(3)=h(3
)-b
2860 PRINT PAPER d; INK e; FLASH
 b;AT r1,c1;w$: PRINT AT 20,pos;
"*";w$;"*"
2870 GO SUB 6000
2880 LET g=g+b: LET max=max-b: GO
 SUB 990
2890 IF max=a THEN LET dir=a
2900 PRINT PAPER d; INK e; BRIGH
T b;AT r1,c1;"*"
2920 GO TO 2400
3000 PRINT AT 19,pos;b$(c+8);b$(
r-5): PAUSE 30: RETURN
4000 REM #### Human's Ships ####
4010 GO SUB 8000: LET pos=8: LET
 bad=4700
4020 PRINT AT 18,a;"HUMAN SHIPS:
 Enter start co-ords A-J , 0-9 ,
 R - Right or U - Up"
4025 PRINT  AT 20,9; PAPER 5;"
    "
4030 FOR n=b TO 6
4035 PRINT AT 21,a;j$: PAUSE e*e
4040 LET r=a: LET c=a: LET z=a:
LET x=5
4050 IF n=b THEN PRINT AT 21,a;"
Battleship (4 squares) ";
4060 IF n=d OR n=3 THEN PRINT AT
 21,a;"Destroyer "+STR$ (n-b)+"
(3 squares) ";
4070 IF n>3 THEN PRINT AT 21,a;"
Frigate "+STR$ (n-3)+" (2 square
s) ";
4080 PRINT AT 21,26; FLASH b;"?"
;: PRINT " ";
4100 GO SUB 7000
4160 IF INKEY$="r" OR INKEY$="R"
 THEN LET z=b: PRINT "R": GO TO
4190
4170 IF INKEY$="u" OR INKEY$="U"
 THEN LET z=d: PRINT "U": GO TO
4190
4180 GO TO 4160
4190 BEEP .1,e+b: PRINT AT 21,26
;" "
4200 IF SCREEN$ (r,c)<>" " THEN
LET i$="Occupied square": GO TO
bad
4210 LET m=3-b*(n>b)-b*(n>3)
4230 REM ** Try to place ship **
4240 FOR x=a TO m
4250 IF z=b THEN LET c1=c+x: LET
 r1=r
4260 IF z=d THEN LET c1=c: LET r
1=r-x
4270 IF SCREEN$ (r1,c1)="X" THEN
 LET i$="Off the board": GO TO b
ad
4280 IF SCREEN$ (r1,c1)<>" " THE
N LET i$="Overlaps another": GO
TO bad
4290 REM ** Check neighbors **
4300 LET v=a: FOR j=-b TO b: FOR
 k=-b TO b
4310 IF SCREEN$ (r1+j,c1+k)<>" "
 THEN IF SCREEN$ (r1+j,c1+k)<>"X
" THEN LET v=b
4320 NEXT k: NEXT j
4330 IF v=b THEN LET i$="Too clo
se": GO TO bad
4340 NEXT x
4350 REM #### Place ship ####
4360 FOR x=a TO m
```

BATTLESHIP

```
4370 IF z=b THEN LET c1=c+x: LET
 r1=r
4380 IF z=d THEN LET c1=c: LET r
1=r-x
4390 PRINT AT r1,c1; INK b;n$(n)
4400 NEXT x
4410 LET pos=pos+d
4420 PRINT AT 20,pos; PAPER 5; I
NK b;n$(n)
4430 NEXT n
4440 FOR x=1 TO 100: NEXT x: RET
URN
4700 REM Invalid routine
4710 PRINT AT 21,a; INK e; PAPER
 d;i$;"  Try again    ": FOR f=1
 TO 3: BEEP .05,3: BEEP .05,12:
BEEP .05,3: BEEP .05,12: NEXT f
4720 FOR f=b TO 100: NEXT f: PRI
NT AT 21,a;j$
4730 GO TO 4040
5000 REM ** Computer's Ships **
5010 GO SUB 8000: LET pos=8
5020 PRINT AT 18,a;"COMPUTER SHI
PS now positioned :"
5100 FOR n=b TO 6
5110 LET m=3-b*(n>b)-b*(n>3)
5120 LET r=INT (RND*(11-m))+6: L
ET c=INT (RND*(11-m))+19
5130 GO TO 5200+100*(RND<.5)
5150 LET pos=pos+d: BEEP .2,12
5160 PRINT AT 20,pos; INK d; FLA
SH b;n$(n)
5170 NEXT n
5180 PAUSE 20: FOR x=b TO 4: BEE
P .05,15: BEEP .07,12: NEXT x: P
RINT AT 21,14; INK 4; FLASH b;"D
one"
5190 PAUSE 200: RETURN
5200 REM *** Ship horizontal ***
5210 LET r1=r: FOR x=a TO m: LET
 c1=c+x
5220 IF SCREEN$ (r1,c1)<>" " THE
N GO TO 5110
5230 GO SUB 5400: IF v THEN GO T
O 5110
5240 NEXT x
5250 FOR x=a TO m: LET k=(r+c+x)
/2
5260 PRINT AT r,c+x; INK e; BRIG
HT ((k-INT k)*d);n$(n)
5270 NEXT x
5290 GO TO 5150
5300 REM *** Ship vertical ***
5310 LET c1=c: FOR x=a TO m: LET
 r1=r+x
5320 IF SCREEN$ (r+x,c)<>" " THE
N GO TO 5110
5330 GO SUB 5400: IF v THEN GO T
O 5110
5340 NEXT x
5350 FOR x=a TO m: LET k=(r+c+x)
/2
5360 PRINT AT r+x,c; INK e; BRIG
HT ((k-INT k)*d);n$(n)
5370 NEXT x
5390 GO TO 5150
5400 REM Check comp's neighbors
5410 LET v=a: FOR j=-b TO b: FOR
 k=-b TO b
5420 IF SCREEN$ (r1+j,c1+k)<>" "
 THEN IF SCREEN$ (r1+j,c1+k)<>"X
" THEN LET v=b
5430 NEXT k: NEXT j: RETURN
6000 REM Hit ship - sound effect
6010 FOR i=e TO a STEP -.1: BEEP
 .005,i: NEXT i: RETURN
6500 REM Miss - sound effect
6510 FOR i=a TO e*e: NEXT i: BEE
P .3,3: RETURN
7000 REM *** Input co-ords ***
7010 LET c=CODE INKEY$-62: IF c>
34 THEN LET c=c-32
7020 IF c<3 OR c>12 THEN GO TO 7
010
7030 PRINT CHR$ (c+62);: BEEP .1
,e-b
7040 LET r=CODE INKEY$-42: IF r<
6 OR r>15 THEN GO TO 7040
7050 PRINT CHR$ (r+42);: BEEP .1
,e
7060 RETURN
8000 REM * Clear bottom lines *
8010 PRINT AT 18,a;j$;j$;j$;j$:
RETURN
9999 CLEAR : SAVE "battleship" L
INE 1: PRINT "REWIND TAPE AND PR
ESS PLAY TO   VERIFY": VERIFY ""
: PRINT "OK"
```



"IT'S BEGINNING TO SHOW SOME HUMAN CHARACTERISTICS — FAULTY REASONING, FORGETFULNESS AND REPETITION."

SHOE

WHAT SEEMS TO BE THE PROBLEM?
WELL, IT JUST STARTED TO GARBLE ALL THE WORDS.
I'M SURE YOU GUYS HAVE A TECHNICAL TERM FOR THAT...
YES. WE DO.

REVRESE

REVRESE is a game of shifting numbers for your 1000. The rules for playing are in the program. Revrese is one of the oldst games programed on computers. This program is from a early issue of SYNC, and I apologize for not knowing the author's name.

```
  5 PRINT
 10 PRINT TAB 11;"REVERSE"
 11 PRINT
 15 PRINT "
"
100 PRINT AT 6,2;"""REVERSE""--
A GAME OF SKILL"
130 DIM A(20)
140 REM ***N = NUMBER OF NUMBER
S
150 LET N=9
160 PRINT AT 20,0;"DO YOU WANT
THE RULES?  (Y/N)"
170 INPUT A$
175 IF A$<>"Y" THEN PRINT AT 20
,0;"WAIT A FEW SECONDS-----""BRA
INS""   AT WORK SCRAMBLING THE L
IST"
180 IF A$<>"Y" THEN GOTO 210
190 GOSUB 710
200 REM ** MAKE A RAMDOM LIST A
(1) TO A(N)
210 LET A(1)=INT ((N-1)*RND*1+2
)
215 LET M=1
220 FOR K=2 TO N
230 LET A(K)=INT (N*RND*1+1)
240 FOR J=1 TO K-1
250 IF A(K)=A(J) THEN GOTO 230
260 NEXT J
270 NEXT K
280 REM ** PRINT ORIGINAL LIST
AND START GAME
290 CLS
300 PRINT AT 4,0;"HERE WE GO...
THE LIST IS:"
310 LET T=0
320 GOSUB 610
330 PRINT AT 12,0;"HOW MANY SHA
LL I REVERSE?"
335 PRINT "
          "
340 INPUT R
345 PRINT AT 12,0;"
                  "
350 IF R=0 THEN GOTO 520
360 IF R<=N THEN GOTO 390
370 PRINT AT 12,0;"OOPS?? TOO M
ANY...
          "
375 PRINT "I CAN REVERSE AT MOS
T ";N
376 FOR U=1 TO 60
377 NEXT U
380 GOTO 330
390 LET T=T+1
400 REM **REVERSE R NUMBERS AND
PRINT NEW LIST
405 LET M=1
410 FOR K=1 TO INT (R/2)
420 LET Z=A(K)
430 LET A(K)=A(R-K+1)
440 LET A(R-K+1)=Z
450 NEXT K
460 GOSUB 610
470 REM ** CHECK FOR A WIN
480 FOR K=1 TO N
490 IF A(K)<>K THEN GOTO 330
500 NEXT K
510 PRINT AT 16,0;"YOU WON IT I
N ";T;" MOVES..."
530 PRINT AT 20,0;"TRY AGAIN? (
YES OR NO)"
540 INPUT A$
550 IF A$="YES" THEN CLS
551 IF A$="YES" THEN PRINT AT 1
0,0;"       HOLD A FEW SECONDS
              WHILE THE LIST
                IS SCRAMBLED."
555 IF A$="YES" THEN GOTO 210
560 PRINT AT 20,0;"O.K. HOPE YO
U HAD FUN.."
570 GOTO 560
600 REM ** SUBROUTINE TO PRINT
LIST
610 PRINT
620 FOR K=1 TO N
625 LET M=M+2
630 PRINT AT 7,M;A(K);" ";
640 NEXT K
650 RETURN
700 REM ** SUBROUTINE TO PRINT
THE RULES
710 CLS
715 PRINT AT 1,1;"THIS IS THE G
AME OF ""REVERSE""."
717 PRINT AT 3,0;"TO WIN ALL, Y
OU HAVE TO DO IS"
720 PRINT "ARRANGE A LIST OF NU
MBERS "
725 PRINT "(1 THROUGH ";N;" ) I
N NUMERICAL"
730 PRINT "ORDER FROM LEFT TO R
IGHT. "
733 PRINT
735 PRINT " TO MOVE, YOU TELL M
E HOW MANY"
740 PRINT "NUMBERS (COUNTING FR
OM THE LEFT)"
745 PRINT "TO REVERSE. "
746 PRINT
750 PRINT "FOR EXAMPLE, IF THE
CURRENT LIST"
751 PRINT "IS:"
760 PRINT " 2 3 4 5 1 6 7 8 9"
770 PRINT "AND YOU REVERSE 4, T
HE RESULT"
775 PRINT "WILL BE:"
780 PRINT " 5 4 3 2 1 6 7 8 9 "
790 PRINT "NOW IF YOU REVERSE 5
, YOU WIN..."
800 PRINT " 1 2 3 4 5 6 7 8 9 "
805 PRINT AT 21,0;"""PRESS ENTE
R"""
806 INPUT A$
807 CLS
810 PRINT AT 4,0;"NO DOUBT YOU
WILL LIKE THIS GAME"
815 PRINT AT 8,12;"""BUT"""
820 PRINT AT 12,4;"IF YOU WANT
TO QUIT,"
825 PRINT AT 14,6;"REVERSE 0 (Z
ERO)."
840 INPUT A$
845 PRINT AT 20,0;"WAIT A FEW S
ECONDS WHILE THER    LIST IS SCR
AMBLE."
850 RETURN
9998 SAVE "REVERSE"
9999 RUN
```

FOR YOUR TS/1000

```
10 FAST
20 FOR X=821 TO 829
30 RAND USR X
30 PAUSE 5
40 NEXT X
50 FOR X=829 TO -821
60 RAND USR X
70 PAUSE 5
80 NEXT X
```

Type this into your TS/1000, turn up the volume on your TV, and RUN

```
1 REM **********
```

TS/1000

Making a long REM line for storing MC on a TS/1000 can be made a lot easier with this short program.

First you need a REM statment with 96 characters. (this will be the last 1 REM you will ever have to key in) next key in the listing in fig. 1. RUN this and the 1000 will ask for the start address. This is 16514. Now you are ready to key in the numbers in Fig. 2. Key in each line of Fig. 2 one line at a time. pressing ENTER at the end of each line. (Each line consists of 12 characters with no spaces.)When you have finished the last line hit "S".

Finally add the lines in Fig. 3 and SAVE. You must have line >2 REM< it is a safety buffer. After you have SAVEd the progran you can RUN it. When the message REM LENGTH? comes up. key in 1000 and ENTER. You will now have a REM with 1000 dots. Delete lines 4,5,6,7,8 & 9. You do not have to use 1000. You can use what ever you need in your program.

FIG. 1

```
9000 PRINT "ADDRESS TO START ?";
9010 INPUT A
9020 PRINT A
9030 LET A$=""
9040 LET X=0
9050 IF A$="" THEN INPUT A$
9060 IF A$="S" THEN STOP
9070 IF X=0 THEN SCROLL
9080 IF X=0 THEN PRINT A;""; "";
9090 PRINT A$( TO 2);" ";
9100 POKE A,16* CODE A$+ CODE A$
(2)-476
9110 LET A=A+1
9120 LET A$=A$(3 TO )
9130 LET X=X+1
9140 IF X=6 THEN GOTO 9040
9150 GOTO 9050
```

FIG 2

```
D60BCD230F01
06002A8240E5
09444D2A2940
09222940210C
403E095E2356
D5EB09EB722B
7323233D2803
D118EEE1E501
E240A7ED4244
4DE1EDB021E3
403600233602
23C103037123
702336EA0B0B
23110100EB19
EB361BEDB036
7534CD2B0FC9
```

FIG 3

```
2 REM
4 PRINT "REM LENGTH ?"
5 INPUT N
6 POKE 16514,N-256* INT (N/256)
7 POKE 16515, INT (N/256)
8 RAND USR 16516
```

CIRCUIT SKETCH

Circuit Sketch allows you to draw simple electronic circuit diagrams on your display, and on your TIMEX printer.

When run you will be asked for the starting coordinates of your circuit. The coordinates will be printed at the upper left of the screen, and updated as you progress. To draw your circuit use the arrow keys, 5, 6, 7, & 8. When you wish to place a component in the circuit, press the key which corresponds to the first letter of that component. The components included in the program are listed at the bottom of the screen. They are

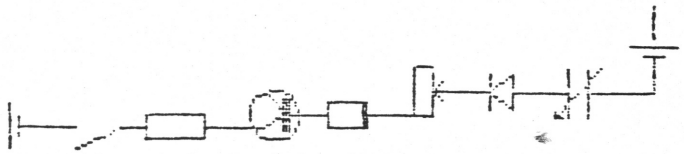
1) CAPACITORS
2) RESISTORS
3) TRANSISTORS
4) DIODES
5) INDUCTOR
6) SWITCH
7) BATTERY
8) FUSE

Once you pressed the key for the component you wish to print, the computer will ask for other infomation on the component. The computer must know if it is to be drawn horizontally or vertically; from the neg. or pos. end; type of transistor (PnP, nPn); whether a resistor is variable ect; ect;

All transistors are drawn horizontally, starting at the base and ending at the collector. All other components may be horizontal, from left to right. Or vertical, bottom to top. Variable resistors are from the central arrow point to the right or top.

Also you may change the plotting position by pressing the "P" key, and keying in the new position. When you want to copy to the printer press the "Z" key.

This program is just the tip of the proverbial "ICEBERG". Other components can be added, IC's, meter's, jacks's, speaker's; ect; ect. Or you can define the keys to draw trees, birds, cats, dogs, and what-not. And use it as a sketchpad.



```
    0>REM [illegible]
    1 POKE 23658,8: POKE 23609,50
    2 INPUT "INITIAL PLOT POSITIO
N? "; INVERSE 1;"X"; INVERSE 0;"
 - ";X;: INPUT "INITIAL PLOT POS
ITION "; INVERSE 1;"Y"; INVERSE
0;" - ";Y
    3 GO SUB 8000
    4 PAPER 7: INK 0: BORDER 6
    5 PLOT X,Y
    6 LET SCREEN=1
    8 PRINT AT 0,0;x;" - ";y
    9 PRINT #1; INVERSE 1;"C"; IN
VERSE 0;"APACITOR "; INVERSE 1;"
T"; INVERSE 0;"RANSISTOR "; INV
ERSE 1;"D"; INVERSE 0;"IODE "; I
NVERSE 1;"F"; INVERSE 0;"USE"; I
NVERSE 1;"B"; INVERSE 0;"ATTERY
"; INVERSE 1;"I"; INVERSE 0;"NDU
CTOR "; INVERSE 1;"R"; INVERSE 0
;"ESISTOR "; INVERSE 1;"S"; INVE
RSE 0;"WITCH"
   10 LET M$=""
   15 LET M$=INKEY$
   30 IF m$>="5" AND m$<="8" THEN
 RESTORE (VAL m$-3)*100
   35 IF M$="Z" THEN GO TO 9000
   46 IF M$>="5" AND M$<="8" THEN
 GO TO 060
   50 RESTORE 55: FOR Z=1 TO 10:
READ U$,U: IF U$=M$ THEN GO TO U
   52 NEXT Z
   55 DATA "F",6500,"B",5500,"S",
6000,"I",3500,"P",1000,"",10,"C"
,2000,"R",2500,"T",3000,"D",4000
   60 READ A,B
   62 IF SCREEN=0 THEN GO TO 64
   64 IF X=255 AND M$="8" OR X=0
AND M$="5" OR Y=175 AND M$="7" O
R Y=0 AND M$="6" THEN LET SCREEN
=0: GO TO 10
   65 LET X=X+A: LET Y=Y+B
   68 PRINT OVER 0;AT 0,0;"
     "
```

```
  69 PRINT OVER 0;AT 0,0;X;" - "
;Y
  70 DRAW A,B
  75 LET SCREEN=1
  80 GO TO 10
 200 DATA -1,0
 300 DATA 0,-1
 400 DATA 0,1
 500 DATA 1,0
1000 INPUT INVERSE 1;"X"; INVERS
E 0;" - COORDINATE? ";X
1005 INPUT INVERSE 1;"Y"; INVERS
E 0;" - COORDINATE? ";Y
1010 PLOT X,Y: GO TO 10
2005 INPUT INVERSE 1;"H"; INVERS
E 0;"ORIZONTAL OR "; INVERSE 1;"
V"; INVERSE 0;"ERTICAL ";K$: GO
SUB 8000
2007 INPUT "ELECTROLTIC? ("; INV
ERSE 1;"Y"; INVERSE 0;"/"; INVER
SE 1;"N"; INVERSE 0;") ";Z$: GO
SUB 8000: IF Z$="Y" THEN GO TO 2
100
2010 INPUT "VARIABLE? ("; INVERS
E 1;"Y"; INVERSE 0;"/"; INVERSE
1;"N"; INVERSE 0;") ";Z$: GO SUB
 8000: IF Z$="Y" THEN GO TO 2050
2015 IF K$="H" THEN DRAW 0,8: DR
AW 0,-16: LET X=X+6: LET Y=Y-8:
PLOT X,Y: DRAW 0,16: DRAW 0,-8:
LET Y=Y+8: GO TO 9
2020 IF K$="V" THEN DRAW -8,0: D
RAW 16,0: LET Y=Y+6: LET X=X+8:
PLOT X,Y: DRAW -16,0: DRAW 8,0:
LET X=X-8: GO TO 9
2050 IF K$="H" THEN PLOT X-4,Y-8
: DRAW 14,16: DRAW 0,-2: DRAW 0,
2: DRAW -2,0: DRAW 2,0: PLOT X,Y
: GO TO 2015
2060 IF K$="V" THEN PLOT X-6,Y-4
: DRAW 16,14: DRAW -2,0: DRAW 2,
0: DRAW 0,-2: DRAW 0,2: PLOT X,Y
: GO TO 2020
2100 INPUT INVERSE 1;"P"; INVERS
E 0;"OS or "; INVERSE 1;"N"; INV
ERSE 0;"EG FIRST? ";Z$: GO SUB 8
000
2110 IF K$="V" AND Z$="P" THEN D
RAW 8,0: DRAW -16,0: DRAW 0,3: D
RAW 16,0: DRAW 0,-3: PLOT X,Y+6:
 DRAW -8,0: DRAW 16,0: DRAW 0,1:
 DRAW -16,0: DRAW 0,1: DRAW 16,0
: DRAW -8,0: LET Y=Y+9: GO TO 9
2120 IF K$="V" AND Z$="N" THEN D
RAW 8,0: DRAW -16,0: DRAW 0,1: D
RAW 16,0: DRAW 0,1: DRAW -16,0:
PLOT X,Y+6: DRAW -8,0: DRAW 16,0
: DRAW 0,3: DRAW -16,0: DRAW 0,-
3: DRAW 0,3: DRAW 8,0: LET Y=Y+9
: GO TO 9
2130 IF K$="H" AND Z$="P" THEN D
RAW 0,8: DRAW 0,-16: DRAW 3,0: D
RAW 0,16: DRAW -3,0: PLOT X+6,Y:
 DRAW 0,8: DRAW 0,-16: DRAW 1,0:
 DRAW 0,16: DRAW 1,0: DRAW 0,-16
: DRAW 0,8: PAUSE 100: LET X=X+9
: GO TO 9
2140 IF K$="H" AND Z$="N" THEN D
RAW 0,8: DRAW 0,-16: DRAW 1,0: D
RAW 0,16: DRAW 1,0: DRAW 0,-16:
PLOT X+6,Y: DRAW 0,8: DRAW 0,-16
: DRAW 3,0: DRAW 0,16: DRAW -3,0
: DRAW 3,0: DRAW 0,-8: LET X=X+9
: GO TO 9
2500 INPUT INVERSE 1;"H"; INVERS
E 0;" OR "; INVERSE 1;"V"; INVER
SE 0;" ",K$: GO SUB 8000
2505 INPUT "VARIABLE? ("; INVERS
E 1;"Y"; INVERSE 0;"/"; INVERSE
1;"N"; INVERSE 0;") ";Z$: GO SUB
 8000
2506 IF Z$="Y" THEN GO TO 2700
2510 IF K$="H" THEN DRAW 0,4: DR
AW 18,0: DRAW 0,-8: DRAW -18,0:
DRAW 0,4: DRAW 0,-4: DRAW 18,0:
DRAW 0,4: LET X=X+18: GO TO 9
2520 IF K$="V" THEN DRAW 4,0: DR
AW 0,18: DRAW -8,0: DRAW 0,-18:
DRAW 4,0: DRAW -4,0: DRAW 0,18:
DRAW 4,0: LET Y=Y+18: GO TO 9
2700 IF K$="H" THEN DRAW -3,3: D
RAW 3,-3: DRAW -3,-3: DRAW 3,3:
DRAW 0,8: DRAW 0,-16: DRAW 6,0:
DRAW 0,16: DRAW -6,0: DRAW 3,0:
LET Y=Y+8: LET X=X+3: GO TO 9
2720 IF K$="V" THEN DRAW -3,-3:
DRAW 3,3: DRAW 3,-3: DRAW -3,3:
DRAW 8,0: DRAW -16,0: DRAW 0,6:
DRAW 16,0: DRAW 0,-6: DRAW 0,3:
LET X=X+8: LET Y=Y+3: GO TO 9
3000 INPUT INVERSE 1;"P"; INVERS
E 0;"NP or "; INVERSE 1;"N"; INV
ERSE 0;"PN ";Z$: GO SUB 8000
3010 IF Z$="N" THEN CIRCLE X+6,Y
,8: PLOT X,Y: DRAW 2,0: DRAW 0,5
: DRAW 0,-10: DRAW 1,0: DRAW 0,1
0: DRAW 1,0: DRAW 0,-10: DRAW 0,
3: DRAW 4,-4: DRAW 0,1: DRAW 0,-
1: DRAW -1,0: DRAW 1,0: DRAW -4,
4: DRAW 0,2: DRAW 6,4: LET X=X+1
0: LET Y=Y+4: GO TO 9
4000 INPUT INVERSE 1;"H"; INVERS
E 0;"ORIZONTAL OR "; INVERSE 1;"
V"; INVERSE 0;"ERTICAL ";Z$: GO
SUB 8000
4010 INPUT INVERSE 1;"C"; INVERS
E 0;"ATHODE or "; INVERSE 1;"A";
 INVERSE 0;"NODE FIRST?";K$: GO
SUB 8000
4020 IF Z$="H" AND K$="C" THEN D
RAW 0,6: DRAW 0,-12: DRAW 0,6: D
RAW 7,-6: DRAW 0,12: DRAW -7,-6:
 DRAW 7,6: DRAW 0,-6: LET X=X+7:
 GO TO 9
4030 IF Z$="H" AND K$="A" THEN D
RAW 0,6: DRAW 0,-12: DRAW 7,6: D
RAW -7,6: DRAW 7,-6: DRAW 0,6: D
RAW 0,-12: DRAW 0,6: LET X=X+7:
GO TO 9
4040 IF Z$="V" AND K$="C" THEN D
RAW 6,0: DRAW -12,0: DRAW 6,0: D
RAW -6,7: DRAW 12,0: DRAW -6,-7:
 DRAW 6,7: DRAW -6,0: LET Y=Y+7:
 GO TO 9
4050 IF Z$="V" AND K$="A" THEN D
RAW 6,0: DRAW -12,0: DRAW 6,7: D
RAW 6,-7: DRAW -6,7: DRAW -6,0:
DRAW 12,0: DRAW -6,0: LET Y=Y+7:
 GO TO 9
5500 INPUT INVERSE 1;"H"; INVERS
E 0;"ORIZONTAL OR "; INVERSE 1;"
V"; INVERSE 0;"ERTICAL ";Z$: GO
SUB 8000
5510 INPUT INVERSE 1;"P"; INVERS
E 0;"OS or "; INVERSE 1;"N"; INV
ERSE 0;"EG FIRST? ";K$: GO SUB 8
000
5520 IF Z$="V" AND K$="P" THEN D
RAW -7,0: DRAW 14,0: PLOT X,Y+3:
 DRAW 3,0: DRAW -6,0: DRAW 3,0:
LET Y=Y+3: GO TO 9
5530 IF Z$="V" AND K$="N" THEN D
RAW 3,0: DRAW -6,0: PLOT X,Y+3:
DRAW -7,0: DRAW 14,0: DRAW -7,0:
 LET Y=Y+3: GO TO 9
5540 IF Z$="H" AND K$="P" THEN D
RAW 0,7: DRAW 0,-14: PLOT X+3,Y:
 DRAW 0,3: DRAW 0,-6: DRAW 0,3:
LET X=X+3: GO TO 9
5550 IF Z$="H" AND K$="N" THEN D
RAW 0,3: DRAW 0,-6: PLOT X+3,Y:
DRAW 0,-7: DRAW 0,14: DRAW 0,-7:
 LET X=X+3: GO TO 9
6000 INPUT INVERSE 1;"H"; INVERS
E 0;"ORIZONTAL OR "; INVERSE 1;"
V"; INVERSE 0;"ERTICAL ";K$: GO
SUB 8000
6010 IF K$="H" THEN DRAW 14,7: L
ET X=X+14: PLOT X,Y: GO TO 9
6020 IF K$="V" THEN DRAW 7,14: L
ET Y=Y+14: PLOT X,Y: GO TO 9
6500 INPUT INVERSE 1;"H"; INVERS
E 0;"ORIZONTAL OR "; INVERSE 1;"
V"; INVERSE 0;"ERTICAL ";K$: GO
SUB 8000
6510 IF K$="H" THEN DRAW 0,4: DR
AW 0,-8: DRAW 1,0: DRAW 0,8: DRA
W 1,0: DRAW 10,0: DRAW 0,-8: DRA
W -10,0: DRAW 10,0: DRAW 0,4: LE
T X=X+13: GO TO 9
6520 IF K$="V" THEN DRAW 4,0: DR
AW -8,0: DRAW 0,1: DRAW 8,0: DRA
W 0,1: DRAW -8,0: DRAW 0,1: DRAW
 8,0: DRAW 0,10: DRAW -8,0: DRAW
 0,-10: DRAW 0,10: DRAW 4,0: LET
 Y=Y+13: GO TO 9
7000 COPY : GO TO 9
8000 FOR Z=1 TO 7: NEXT Z: RETUR
N
9000 COPY : GO TO 10
9998 STOP
9999 SAVE "circsketch" LINE 1
```

PICTRANS

This is also for the SPECTRUM and it does nothing. Nothing but show off your computer.
If you only want listings that play games or balances your check book your missing some of the fun. Type in this program and just watch it go.

```
  10 REM *** PICTURE TRANSFORMAT
ION PROGRAM ***
  20:
  30 REM ** Clear area for machi
ne code and tables **
  40 CLEAR 45055
  50 REM ** Load the machine cod
e into memory (B000h upwards)
  60 GO SUB 1110
  70 RESTORE 870
  80 READ steps,points,lines,sha
pes
  90 LET m=2*shapes
 100 REM ** Byte tables start at
 C000h
 110 LET s=49152
 120 LET c=s+m*points
 130 LET l=c+m*points
 140 LET p=l+2*lines
 150 LET n=p+2*points
 160 LET steps=steps-1
 170 LET points=points-1
 180 LET lines=lines-1
 190:
 200 REM ** Poke the table start
  locations
 210 POKE 45065,INT (l/256): POK
E 45064,INT (l-PEEK (45065)*256)
 220 POKE 45067,INT (n/256): POK
E 45066,INT (n-PEEK (45067)*256)
 230 POKE 45069,INT (p/256): POK
E 45068,INT (p-PEEK (45069)*256)
 240 POKE 45074,lines+1
 250 POKE 45075,points+1
 260 POKE 45077,INT (c/256): POK
E 45076,INT (c-PEEK (45077)*256)
 270 POKE 45079,m
 280:
 290 REM ** Read the coordintes
for points in each shape
 300 FOR j=0 TO points
 310 FOR j=0 TO shapes-1
 320 READ x,y
 330 POKE (s+m*i+2*j),x
 340 POKE (s+m*i+2*j+1),y
 350 NEXT j: NEXT i
 360:
 370 REM ** Calculate offsets be
tween shapes for each point
 380 FOR i=0 TO lines
 390 READ pt1,pt2
 400 POKE (l+2*i),pt1
 410 POKE (l+2*i+1),pt2
 420 NEXT i
 430:
 440 FOR i=0 TO points
 450 FOR j=0 TO shapes-1
 460 LET k=j+1: IF k=shapes THEN
 LET k=0
 470 LET cx=(PEEK (s+m*i+2*k)-PE
EK (s+m*i+2*j))/steps
 480 LET cy=(PEEK (s+m*i+2*k+1)-
PEEK (s+m*i+2*j+1))/steps
 490 POKE (c+m*i+2*j),INT (cx+0.
5)
 500 POKE (c+m*i+2*j+1),INT (cy+
0.5)
 510 NEXT j: NEXT i
 520:
 530 REM ** Set previous shape n
umber to zero
 540 LET y=0
 550:
 560 REM ** Set the n(ext) shape
 points to zero for first plot
 570 FOR i=0 TO points
 580 POKE (n+2*i),0
 590 POKE (n+2*i+1),0
 600 NEXT i
 610:
 620 CLS
 630:
 640 REM ** MAIN SHAPE LOOP **
 650:
 660 REM ** x=present shape; y=n
ext shape
 670 LET x=y
 680 POKE 45078,x
 690 LET y=x+1: IF y=shapes THEN
 LET y=0
 700 REM ** Set start coordinate
s for shape x
 710 FOR i=0 TO points
 720 POKE (p+2*i),PEEK (s+m*i+2*
x)
 730 POKE (p+2*i+1),PEEK (s+m*i+
2*x+1)
 740 NEXT i
 750:
 760 REM ** Main transform shape
 loop
 770 FOR k=0 TO steps
 780 REM ** Call machine code
 790 RANDOMIZE USR 45080
 800 REM ** Delay loop at start
of transformation
 810 IF k=0 THEN FOR j=1 TO 200:
 NEXT j
 820 NEXT k
 830 GO TO 670
 840:
 850:
 860 REM ** SHAPE DATA **
 870 DATA 11,19,19,8
 880 DATA 50,130,150,10,50,100,1
50,130,70,30,50,150,150,10,50,15
0
 890 DATA 100,150,50,10,50,150,1
40,110,70,10,50,150,50,10,70,150
 900 DATA 150,130,50,30,70,150,1
00,130,50,10,60,150,50,30,70,90
 910 DATA 150,90,90,30,70,100,70
,90,50,30,70,150,90,30,100,50
 920 DATA 100,70,90,50,70,40,70,
70,50,50,70,150,90,50,130,150
 930 DATA 70,50,90,100,130,150,1
00,30,50,100,80,100,90,100,150,1
50
 940 DATA 100,30,90,130,150,150,
140,50,50,150,90,100,90,130,120,
90
 950 DATA 140,50,50,130,150,100,
150,30,100,150,110,100,50,130,14
0,60
 960 DATA 150,30,50,150,150,50,1
30,10,130,150,120,100,50,150,150
,60
 970 DATA 100,10,150,150,150,10,
90,10,150,150,130,150,150,150,15
0,50
 980 DATA 50,30,150,130,130,20,6
0,30,150,130,130,150,150,130,150
,40
 990 DATA 50,70,110,130,130,100,
50,60,130,130,140,150,110,130,14
0,20
```

```
1000 DATA 100,90,110,100,130,120
,50,100,100,130,150,150,110,100,
80,10
1010 DATA 130,110,110,50,70,10,6
0,130,70,130,150,150,110,50,50,1
0
1020 DATA 100,130,110,30,50,10,9
0,150,70,100,110,10,110,30,50,50
1030 DATA 60,110,150,30,50,50,13
0,150,70,50,90,10,150,30,50,100
1040 DATA 0,0,0,0,0,0,0,0,0,0,10
0,50,0,0,70,70
1050 DATA 0,0,0,0,0,0,0,0,0,0,90
,80,0,0,130,50
1060 DATA 0,0,0,0,0,0,0,0,0,0,11
0,80,0,0,70,30
1070 DATA 0,1,1,2,2,3,3,4,4,5,5,
6,6,7,7,8,8,9,9,10
1080 DATA 10,11,11,12,12,13,13,1
4,14,15,15,0
1090 DATA 16,17,17,18,18,18
1100:
1110 REM ** Machine code load ro
utine
1120 LET loc=45056
1130 LET check=0
1140 CLS : PRINT AT 10,10;"PLEAS
E WAIT"
1150 RESTORE 1230
1160 READ n
1170 IF n>=0 THEN POKE loc,n: LE
T loc=loc+1: LET check=check+n:
GO TO 1160
1180 IF check=29989 THEN RETURN
1190 PRINT "Checksum is ";check;
"."
1200 PRINT "Should be    29989."
1210 PRINT "Check program and re
run."
1220 STOP
1230 DATA 0,0,0,0,0,0,0,0
1240 DATA 0,0,0,0,0,0,0,0
1250 DATA 0,0,0,0,0,0,0,0
1260 DATA  58, 18,176
1270 DATA  42,  8,176
1280 DATA 34,14,176
1290 DATA 42,10,176
1300 DATA 34,16,176,245
1310 DATA 205,68,176
1320 DATA 42,12,176
1330 DATA 34,16,176
1340 DATA 205,68,176
1350 DATA 42,14,176,35
1360 DATA 35,34,14,176
1370 DATA 241,61,32,225
1380 DATA 205,238,176,201
1390:
1400 DATA 237,91,14,176
1410 DATA 26,203,39,22
1420 DATA 0,95
1430 DATA 42,16,176,25
1440 DATA 70,35,78,197
1450 DATA 237,91,14,176
1460 DATA 19,26,203,39
1470 DATA 22,0,95
1480 DATA 42,16,176,25
1490 DATA 70,35,78,225
1500 DATA 205,109,176,201
1510:
1520 DATA 197,205,199,176
1530 DATA 193,17,1,1
1540 DATA 120,148,48,4
1550 DATA 21,21,237,68
1560 DATA 71,121,149
1570 DATA 48,4,29,29
1580 DATA 237,68,79,176
1590 DATA 200,121,184,229
1600 DATA 98,107
1610 DATA 34,4,176
1620 DATA 46,0,56,4
1630 DATA 101,107,72,71
1640 DATA 34,6,176
1650 DATA 96,120,203,63
1660 DATA 111,125,129
1670 DATA 56,3,184
1680 DATA 56,8,144,111
1690 DATA 237,91,4,176
1700 DATA 24,5,111
1710 DATA 237,91,6,176
1720 DATA 227,124,130,103
1730 DATA 125,131,111,197
1740 DATA 205,199,176,193
1750 DATA 227,37,32,220
1760 DATA 225,201
1770:
1780 DATA 125,230,192
1790 DATA 31,55,31
1800 DATA 15,173,230,248
1810 DATA 173,87,124,7
1820 DATA 7,7,173
1830 DATA 230,199,173,7
1840 DATA 7,95,124
1850 DATA 230,7,71,4
1860 DATA 62,254,15
1870 DATA 16,253,71,26
1880 DATA 168,47,18,201
1890 DATA 58,19,176
1900 DATA 245,245,61,203
1910 DATA 39,22,0,95
1920 DATA 42,12,176,25
1930 DATA 126,42,10,176
1940 DATA 25,119,19
1950 DATA 42,12,176,25
1960 DATA 126,42,10,176
1970 DATA 25,119,241,61
1980 DATA 27,213,95
1990 DATA 58,23,176
2000 DATA 33,0,0
2010 DATA 6,8,41,23
2020 DATA 48,1,25
2030 DATA 16,249,237,91
2040 DATA 20,176,25,237
2050 DATA 91,22,176
2060 DATA 22,0,203,35
2070 DATA 25,68,77
2080 DATA 42,12,176,209
2090 DATA 25,10,63,134
2100 DATA 119,35,3,10
2110 DATA 63,134,119,241
2120 DATA 61,32,172,201
2130 DATA -99: REM ** Dummy end
of data value
9999 CLEAR : SAVE "Pictrans" LIN
E 1: PRINT "REWIND TAPE"''"PRESS
 PLAY TO VERIFY": VERIFY "": PRI
NT "OK"
```

64 COLUMNS WITH SPECTRUM ROM

To print 64 columns in SPECTRUM mode, you call channel #8 with the comand

```
PRINT #8;"SLUG"
```

To print in double size you would call channel #8

```
PRINT #8; "LOUISVILLE"
```

If you want to go all the way you can quadruple (eight characters per line) your display. Use channel #8 and graphics code 129 & 130, (graphics 1 & 2) to togel in and out of quad

```
PRINT #8;"▝▘ or ▖▗"
```

64 mode will only print upper case, But double and quad will print all characters except the block graphics. You will also be able to LIST #8

To start, type CLEAR 64732, then type in this simple loader program, or your own loder program. Then POKE in Listing #1 After you have POKEd in the 834 bytes, type in list #2, then you can GOTO 9999 to save. Now when you LOAD "64wide", List #2 will set up the vectors in the channel information area for you, so all you have to do is type #8; after PRINT when you went to print in 64 columns.

If you want to check your CODE after you have POKEd it all in,type in List #3 turn on your printer and type GOTO 10

----- DO NOT TYPE RUN -----

this will print out your CODE so you can debug if needed.

#3

```
10 LET add=64733
20 FOR n=1 TO 128
30 LPRINT add;
40 FOR g=7 TO 27 STEP 5: LPRIN
T TAB g;PEEK add;: LET add=add+1
: NEXT g: LPRINT TAB g+1:
50 NEXT n
```

#2

```
11 POKE 23593,255
12 POKE 23602,194
13 POKE 23603,253
14 POKE 23681,2
15 POKE 23590,127
16 POKE 23591,255
17 POKE 23604,221
18 POKE 23605,252
20 CLEAR 64732
30 LOAD "64wide"CODE 64733,834
31 STOP
9999 SAVE "64wide" LINE 1: SAVE
"64wide"CODE 64733,834
```

LOADER

```
10 FOR n=64733 TO 65638
20 INPUT a
30 POKE n,a
40 PRINT n,a
50 NEXT n
```

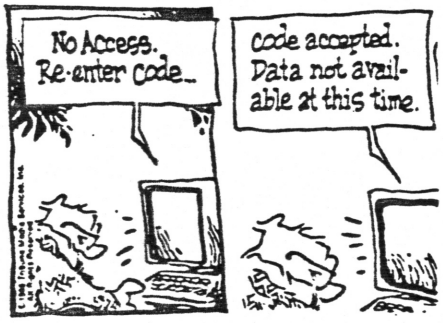
#1

64733	254	16	218	244	9
64738	254	32	48	9	33
64743	187	92	34	81	92
64748	195	244	9	33	129
64753	92	254	129	32	3
64758	54	4	201	254	130
64763	32	3	54	2	201
64768	1	8	0	254	144
64773	56	8	237	91	123
64778	92	214	144	24	4
64783	237	91	54	92	111
64788	96	41	41	41	25
64793	17	0	91	237	176
64798	42	136	92	58	129
64803	92	245	189	56	14
64808	46	33	71	237	66
64813	229	68	205	155	14
64818	34	132	92	225	241
64823	245	60	60	79	124
64828	230	127	185	48	8
64833	229	205	254	13	225
64838	36	24	228	34	136
64843	92	241	71	8	237
64848	91	132	92	33	0
64853	91	197	8	71	8
64858	197	8	254	2	32
64863	37	8	6	4	175
64868	203	22	48	2	246
64873	192	203	22	48	2
64878	246	48	203	22	48
64883	2	246	12	203	22
64888	48	2	246	3	18
64893	20	18	20	35	16
64898	224	24	27	8	6
64903	2	203	22	159	230
64908	240	79	203	22	159
64913	230	15	177	0	18
64918	20	18	20	18	20
64923	18	20	35	16	232
64928	193	21	229	213	235
64933	37	205	219	11	209
64938	225	123	198	32	95
64943	62	0	138	230	248
64948	87	16	163	33	132
64953	92	52	46	136	53
64958	193	16	142	201	254
64963	96	32	2	62	64
64968	254	16	218	244	9
64973	254	32	48	9	33
64978	187	92	34	81	92

64983	195	244	9	254	91
64988	210	244	9	214	32
64993	135	135	33	105	254
64998	22	0	95	25	229
65003	42	132	92	237	75
65008	136	92	121	61	32
65013	6	14	33	5	205
65018	155	14	120	254	3
65023	48	16	8	58	4
65028	92	60	40	250	8
65033	205	254	13	6	3
65038	33	160	80	209	62
65043	170	15	50	19	254
65048	245	197	229	6	4
65053	48	31	126	230	15
65058	119	26	230	240	182
65063	119	36	126	230	15
65068	119	26	203	39	203
65073	39	203	39	203	39
65078	182	119	36	19	16
65083	227	24	29	126	230
65088	240	119	26	203	63
65093	203	63	203	63	203
65098	63	182	119	36	126
65103	230	240	119	26	230
65108	15	182	119	36	19
65113	16	227	37	205	219
65118	11	225	193	241	56
65123	2	35	13	195	232
65128	10	0	0	0	0
65133	4	68	64	64	90
65138	0	0	0	10	234
65143	174	160	70	240	102
65148	196	21	18	72	168
65153	0	0	0	0	68
65158	0	0	0	2	68
65163	68	32	4	34	34
65168	64	10	70	196	160
65173	0	68	228	64	0
65178	0	4	72	0	0
65183	224	0	0	0	4
65188	64	1	18	72	128
65193	4	170	170	64	4
65198	68	68	64	4	162
65203	104	224	4	162	98
65208	224	2	106	242	32
65213	14	142	42	64	6
65218	142	170	64	14	36
65223	72	128	4	170	234
65228	164	4	170	98	192
65233	0	64	4	0	0
65238	0	64	72	1	36

65243	132	32	0	14	14
65248	0	8	66	36	128
65253	4	162	68	4	6
65258	68	228	224	4	170
65263	234	160	12	172	170
65268	192	4	168	138	64
65273	12	170	170	192	14
65278	140	136	224	14	140
65283	136	128	4	168	186
65288	96	10	170	234	160
65293	14	68	68	224	7
65298	34	42	96	8	172
65303	202	160	8	136	136
65308	224	9	249	153	144
65313	10	238	238	160	14
65318	170	170	224	14	170
65323	200	128	4	170	170
65328	97	14	170	202	160
65333	4	168	66	192	14
65338	68	68	64	10	170
65343	170	64	10	170	164
65348	64	9	153	159	144
65353	10	164	74	160	10
65358	170	68	64	14	36
65363	72	224	221	240	254
65368	0				

SHOE



Into Astronomy ?

If you have a modem and subscribe to CompuServe, you can obtain quick news from Sky & Telescope magazine of comet and nova discoveries. You may also get program listings from the Astronomical Computing Dept. Log on, and at any ! prompt, type GO SPACEFORUM. Then you select the DL7 data base and type READ SKYTEL.TEX in order to receive this service.

With This program you will be able to create a darker character image on the TV and 2040 printer. After you RUN the program you can NEW, as it is safe above RAM-TOP. To turn it on ENTER, RANDOMIZE USR 57786. To return to normal POKE 23607,60

```
 10>CLEAR 56675
 20 RESTORE : LET A=57786
 30 READ N
 40 IF N=-1 THEN GO TO 80
 50 POKE A,N
 60 LET A=A+1
 70 GO TO 30
 80 STOP
 90 DATA 17,0,221,213,1,0,3,42,
54,92,36,126,167,31,182,18,35,19
,13,32,246,16,244,225,37,34,54,9
2,201,-1
```

You use this program for a FADEOUT when you CLEAR SCREEN. When you wish to CLS, use RANDOMIZE USR 60000. You can also use it to simulate a crash.

```
 10 RESTORE : FOR n=60000 TO 60
849
 20 READ a: POKE n,a: NEXT n
 30 FOR n=0 TO 21: PRINT "
                         ": NE
XT n
 40 PAUSE 60
 50 RANDOMIZE USR 60000
 60 DATA 17,254,8,123,7,7,7,95,
33,0,64,1,24,0,126,163,119,35,16
,250,13,32,247,21,32,233,58,141,
92,119,84,93,19,1,192,2,237,176,
58,72,92,119,14,63,237,176,201,0
,0,0
```

This is a aid in debuging. With this program as the first 9 lines of your program, you can SCROLL your listing on the monitor with a blank line between each program line. You just GO TO 1 to start the SCROLL.

```
 1 CLS : LET FLAG=2: LET A=267
89
 2 LET END=((PEEK 23627+256*PE
EK 23628)-1): GO SUB 8: FOR A=26
710 TO END-1
 3 IF PEEK A=14 THEN LET A=A+4
: NEXT A
 4 IF PEEK A>31 OR PEEK A=13 T
HEN PRINT CHR$ PEEK A;: IF PEEK
A=13 THEN PRINT
 5 LET FLAG=FLAG-1: IF PEEK A=
13 THEN GO SUB 8: LET FLAG=3: LE
T A=A+3: PRINT " ";: NEXT A
 6 NEXT A: STOP
 7 REM line # sub
 8 IF A>END-1 THEN STOP
 9 PRINT PEEK (A+2)+(PEEK (A+1
)*256);: RETURN
```

Do you have CALL WAITING ?

If you have been geting GARBAGE or a disconnect while on line with your MODEM, it may be an in-coming call disrupting the transmission. Their is a way to temporarily cancel CALL WAITING on a call by call basis. To cancel BEFORE you dial on a 12 BUTTON TOUCH-TONE set dial *** 70** then your number. On a ROTARY dial (which is how the 2050 MODEM dials out) dial **1170** then your number. CALL WAITING will reset automatically when you hang-up the phone.

TAPE TO TAPE BACKUP

This program is worth its weight in gold. With it you will be able to make your backup tapes to all your expensive programs. It runs on the 2068, but will also make backup tapes of SPECTRUM programs. All instructions are in the program.

```
  1 REM      TAPE to TAPE backup
               program using two
                 tape recorders
  2 REM
                  by LARRY KENNY

  10 CLEAR 59999
  20 FOR a=60000 TO 60019
  25 READ x: POKE a,x
  30 NEXT a: CLS
  40 PRINT                                "
   This  Program  Is For Making
Tape To  Tape Copies  Using The
2068 As A Singnal Reconditioner"
  45 PRINT                                "
 (IT WILL NOT LOAD A PROGRAM)":
PRINT
  50 PRINT                                "
   Using  Two Tape  Records  You
Play  The  Origional  Tape  Into
The  Input  Of  The  2068 (Ear).
And  Record  Your  Backup  Tape
From  The  Output  Of  The  2068
(Mic).": PRINT                            "
  60 PRINT
   Ajust The Play Volume So The
Boder Doesn't Flick  To Much On
The Silent Periods Of The Tape."
: PRINT : PRINT                           "
  70 PRINT INK 3;
  Rewind  Both  Recorders, Then
Run  The  Tape  Of  The  Saving
Recorder Past  The  Leader. Now
Start The Loading Recorder.....
        AND PRESS ANY KEY"
           PAUSE 0
  75 CLS : PRINT AT 10,6;"KEY "" 
3"" TO STOP"
  80 RANDOMIZE USR 60000
  90 DATA 243,219,254,31,31,31,4
8,10,203,95,40,2,246,4,211,254,2
4,239,251,201
```

THANKS TO LARRY KENNY + SUM MAGAZINE

SCREEN COPY

This program from SINCUS will stop your program, make a screen copy on your 2040 printer, and cont. the program. If you have " BYTE POWER" (the magazine on tape). You can make a HARD-COPY of the program instructions with this utility. All you have to do is just LOAD and RUN this program, then LOAD your "BYTE POWER" tape. When you want a copy of the page sent to your printer, all you have to do is hit BREAK & SYMBOL SHIFT together.

```
  5 REM     COMPUTUS INTERRUPTUS
 10 REM      By WES  BRZOZOWSKI
                 SINCUS
 15 REM     Cause a SCREEN-COPY
            when BREAK & SYMBOL
            SHIFT are pressed at
            the same time
 30 CLEAR 65020
 40 FOR j=65024 TO 65280: POKE
j,253: NEXT j
 50 POKE 65021,195: POKE 65022,
6: POKE 65023,255
 60 FOR j=65281 TO 65314: READ
k: POKE j,k: NEXT j
 70 DATA 62,254,237,71,237,94,2
01,245,197,213,229,62,127,219,25
4,246,224,254,252,32,6,243,6,192
,205,5,10,225,209,193,241,195,56
,0
 80 RANDOMIZE USR 65281
```

SLOW PRINT

T/S 2068

```
10 LET A$="Print  your  message"
20 FOR K=1 TO LEN (A$)
30 PRINT A$ (K TO K);: PAUSE 2
40 BEEP .02,.5
50 NEXT K
```

T/S 1000

```
10 LET A$= "YOUR MESSAGE"
20 FOR K=1 TO LEN (A$)
30 PRINT A$ (K TO K)
40 PAUSE 5
50 NEXT K
```

No self respecting computer would ever print this slow, but all science fiction movies have the printing slowed down for dramatic effect. So their is no reason for your programs not being dramatic also.

CP/M ?

With the new TIMEX disk drive now available and a CP/M option promised, some of us are wondering. Just what is CP/M and where did it come from? And what is it's relation to the Z80? CP/M, or CONTROL PROGRAM for MICROPROCESSOR, is an operating system such as ME-DOS, and the new GEM. It is not, as some may think, a programing language.

To answer the next two questions we must go back to 1973. That year INTEL made the first processor, the 4 bit 4004. Soon it was superceded by the 4040, which is also a 4 bit processor. Soon after, the 8 bit processors were introduced. First the 8008 then 8080, 8085 and finally, the Z80. It was realised that these powerful (for their time) processors would need some means of a standardised control. In 1975 Gary Killdall, a employee of INTEL developed what we now know as CP/M. INTEL apparently was not interested in this development, so Killdall left and formed his own company, which is now Digital Research.

CP/M has a structure which makes it possible to transplant to all Z80 machines. Three basic implementations are:

CCP (console command processor)
Reads and interprets commands From the keyboard.

BDOS (basic disk operating system)
Utility routines designed to manage the disk files (locating blocks, verifying, alloation and releasing storage areas)

BIOS (basic input/output system)
Routines which communicate with physical devices attached to system (printer, modem ect)

These are laid out in memory in sequence with the users program starting at hex 100, this is termed TPA (transient program area). Only the BIOS source code has to be specific to the machine.

If CP/M is so old why is it still around? Because of it's age it has the most software in the "Public Domain". There is a CP/M based software for all applications you can think of, and some you would never think of. And most importantly it has most all of the bugs ironed out. Also, almost every programming language is implemented on CP/M.

LONDON BRIDGE is a game of nerves. You are to get to the other side, but the building stones keep falling from the roadway. Which way you step determines your score. Full instructions are in the listing.

If you dont want to key in all of the program, just key in to line 1000 and change line 1010 to: 1010 GOTO 5 :That will be enough to play the game, you can read through the the listing for all the instructions.

```
  5 FAST
  7 CLS
 10 RAND 0
 20 DIM A(66)
 30 PRINT AT 2,9;"LONDON BRIDGE
"
 40 LET HR=1000
 45 PRINT AT 15,22;"HI"
 50 PRINT AT 16,22;"SCORE=";HR;
TAB 11;"▒       ▒";TAB 0;"INPUT"
;TAB 1;"123";TAB 1;"456";TAB 1;"
789"
 55 PRINT AT 6,11;"▒▒▒  ▒  ▒▒▒"
 60 FOR I=1 TO 11
 70 PRINT TAB 12;"▒     ▒"
 80 NEXT I
 90 FOR N=11 TO 60
100 LET A(N)=INT (RND*5)+1
110 LET A$=CHR$ (28+A(N))
120 LET M=(N-1)/5
130 GOSUB 500
135 NEXT N
140 LET N=8
145 SLOW
150 LET A(N)=-28
155 PRINT AT 19,24;"NEXT";AT 20
,20;"TO COLLAPSE"
160 LET DROP=INT (RND*(67-N)+N-
6)
170 IF A(DROP)<=0 THEN GOTO 160
180 PRINT TAB 25;A(DROP)
190 INPUT DIR
200 LET I=INT (DIR-1)/3
205 LET M=(N-1)/5
210 LET J=M-INT M+I-INT I
220 LET N1=N+5*(INT I-1)+3*(I-I
NT I)-1
230 IF DIR<1 OR DIR>9 OR J<0.1
OR J>1.4 OR N1<6 THEN GOTO 190
235 IF A(N1)<=0 AND N1<=60 THEN
GOTO 190
240 IF N1>60 THEN LET A(N1)=-28
250 LET A$=CHR$ (28+A(N))
260 GOSUB 500
270 LET M=(N1-1)/5
280 LET A$=CHR$ (156+A(N1))
290 GOSUB 500
300 PRINT AT 19,24;"    ";AT 20
,20;"        ";TAB 25;" "
310 FOR J=1 TO 70
320 NEXT J
330 LET M=(DROP-1)/5
350 LET A$=" "
360 GOSUB 500
370 IF N1=DROP THEN GOTO 600
380 IF N1>60 THEN GOTO 800
390 LET SCORE=10*(3-INT I)+10*(
2-INT I)*(1-INT I)
400 IF A(N1)=A(DROP) THEN LET S
CORE=SCORE+3
410 GOSUB 900
420 LET A(DROP)=0
430 LET N=N1
440 GOTO 155
500 PRINT AT 5+INT M,13+5*(M-IN
T M);A$
510 RETURN
600 PRINT AT 20,16;"YOU HAVE FA
LLEN ";TAB 13;"IN THE WATER"
610 FOR 0=1 TO 100
615 NEXT 0
617 CLS
620 CLS
625 GOTO 1500
800 LET SCORE=1000
810 GOSUB 900
```

```
 815 CLS
 817 PRINT AT 13,4;"DO YOU WANT
TO TRY AGAIN";AT 21,0;"(Y OR N)"
 819 LET Z$=INKEY$
 820 IF Z$="Y" THEN GOTO 5
 825 IF Z$="N" THEN GOTO 950
 830 IF Z$="" THEN GOTO 819
 900 LET A(1)=A(1)+SCORE
 910 PRINT AT 11,22;"SCORE ";SCO
RE;"  "
 920 PRINT AT 13,22;"TOTAL ";A(1
)
 925 IF SCORE>1000 THEN LET WR=S
CORE
 930 RETURN
 950 CLS
 955 STOP
1000 SAVE "BRIDGE"
1010 GOTO 1100
1100 PRINT AT 3,0;"
1105 PRINT "
1110 PRINT "
1115 PRINT "
1120 PRINT "
1125 PRINT "
1130 PRINT "
1135 PRINT "
1140 PRINT AT 14,8;"""LONDON  BR
IDGE"""
1145 FOR F=1 TO 70
1150 NEXT F
1155 FOR F=1 TO 3
1160 SCROLL
1165 NEXT F
1170 PRINT AT 9,0;"THE GAME CONS
ISTS OF  A GRAPHIC"
1171 PRINT
1175 PRINT "BRIDGE,AS SEEN FROM
ABOVE, WITH"
1176 PRINT
1180 PRINT "THE ROADWAY MADE UP
OF A RANDOM"
1182 PRINT
1185 PRINT "MIX OF THE NUMBERS 1
 TO 5,"
1187 PRINT
1190 PRINT "REPRESENTING FIVE TY
PES OF FLAG-"
1192 PRINT
1195 PRINT "STONES.YOU ARE REQUI
RED TO CROSS"
1197 PRINT
1200 PRINT "TO THE OTHER SIDE,BU
T..........."
1205 FOR F=1 TO 150
1210 NEXT F
1215 FOR F=1 TO 22
1220 SCROLL
1225 NEXT F
1230 PRINT AT 10,5;"LONDON  BRID
GE IS"
1235 PRINT AT 12,7;"FALLING";AT
13,16;"D";AT 14,17;"O";AT 15,18;
"W";AT 16,19;"N"
1240 CLS
1245 PRINT AT 3,0;"I WILL GIVE Y
OU A NUMBER,PERHAPS"
1246 PRINT
1250 PRINT "4.THIS TELLS YOU THA
T ONE OF THE"
1251 PRINT
1255 PRINT "TYPE 4 STONES IS ABO
UT TO FALL "
1256 PRINT
1260 PRINT TAB 7;"INTO THE RIVER
..."
1265 PRINT
1270 PRINT
1275 PRINT "IN SELECTING YOUR NE
XT MOVE,YOU"
1276 PRINT
1280 PRINT "CAN GAMBLE BY MOVING
 ONTO A 4"
1281 PRINT
1285 PRINT "OR BY PLAYING SAFE A
ND SELECTING"
1286 PRINT
1290 PRINT TAB 6;"A DIFFERENT NU
MBER."
1295 FOR F=1 TO 150
1300 NEXT F
1305 FOR F=1 TO 22
1310 SCROLL
1315 NEXT F
1320 PRINT AT 3,0;"YOU ENTER YOU
R MOVE BY FOLLOWING"
1321 PRINT
1325 PRINT "THE NUMBER GRID UNDE
R ""INPUT"" IN"
1326 PRINT
1330 PRINT "THE LOWER LEFT OF YO
UR SCREEN"
1331 PRINT
1332 PRINT
1335 PRINT TAB 2;"MOVE";TAB 14;"
YOU SCORE"
1340 PRINT TAB 4;"FORWARDS";TAB
16;"10"
1341 PRINT
1345 PRINT TAB 4;"SIDEWAYS";TAB
16;"20"
1346 PRINT
1350 PRINT TAB 4;"BACKWARDS";TAB
 16;"50"
1351 PRINT
1355 PRINT "YOU TRIPLE YOUR SCOR
E IF YOU"
1356 PRINT
1360 PRINT "MOVE TO A STONE THAT
 IS ABOUT TO"
1361 PRINT
1365 PRINT TAB 14;"FALL"
1370 FOR F=1 TO 150
1375 NEXT F
1380 FAST
1385 CLS
1390 GOTO 10
1500 PRINT AT 13,4;"DO YOU WANT
TO TRY AGAIN";AT 21,0;"(Y OR N)"
1510 LET Z$=INKEY$
1520 IF Z$="Y" THEN GOTO 5
1530 IF Z$="N" THEN GOTO 950
1540 IF Z$="" THEN GOTO 1510
```

'My God Atkinson! I think it says computer room.'

3 minute ego

If you have a program you use often and the loading time is under three minutes, then RADIO SHACK has just what you need. Stock number 43-407 is a three minute outgoing message tape. It was made for telephone answering machines, but why cant you use it for a short program? With a 3 minute endles tape you would not have to rewind the tape. One program that would be just right is "TASWORD II" it loads in two minutes. Or you could use the tape for your sub-routines and utilities.

T/S 1000 BANNERS

by Jim Pitts

This program will allow you to print large banners on your ZX81 or T/S1000. The program is menu driven and requires little explaination. The one exception to this, is the feature that allows you to define your own 8x8 block characters. When you enter this portion of the program, you will see a grid with letters across the top and numbers down the side. Do nothing until you are prompted to. This section of the program takes a bit of time to initialize. You will then be expected to move the flashing asterisk around the grid, depositing black blocks wherever you like, using the "Z" key. These blocks may be erased with the "M" key. A little practice will make it all clear to you.

While the 8x8 blocks do not allow detailed graphics, they will allow you to define small letters and simple logos.

The hart of the program is a machine language routine in the first REM line. Type in a REM statment with 171 characters and POKE in the values from the table using any decimal based code loader.

Play around with the program and you will find it is capable of producing some nice banners with interesting features

```
   1 REM HI                YG■+++++-
ACS >?5 2;"▒ )■RND GOSUB ■:▒Y"M■
RND5■RND■M■RND▒"▒)WRND■RND*ACS  SI
N M■RND/▒U■RND*ACS  ▒M■RNDM■RNDF(
 LPRINT U■RNDXM■RNDCO1VRND▒"■LN  ,
INKEY$U■RND*M■RNDK▒Y▒/"■)<><><(
REM LN  ,INKEY$ PRINT VAL STR$ FA
ST LN ?▒ LPRINT SGN AT LET U■RND
M■RND/?$4■TAN PRINT Y" )<Y▒)<Y" )<
Y  )< LET TAN
  10 REM ■■■■■■■■■■■■■■■■■■■■■■■■
  11 REM BY JIM PITTS
  12 REM SINCLAIR LOUISVILLE
           USERS      GROUP
  13 REM 1434 GODDARD AVE.
  14 REM LOUISVILLE,KY 40204
  40 LET W=3
  50 DIM D(4)
  60 DIM Z(8,8)
  70 DIM X(90,8)
 100 CLS
 110 PRINT "■■■■■■■■■■■■■■■■■■■
```

```
1120 LET W=3
1130 GOTO 1035
1999 CLS
2000 PRINT "[graphics]
[graphics]"
2010 PRINT
2020 PRINT "128 1    3    5    6
134 138"
2030 FOR I=1 TO 9
2040 PRINT "[graphics]
[graphics]"
2050 NEXT I
2060 PRINT
2070 PRINT "EXAMPLES ONLY. USE A
NY NON-      TOKEN CHARACTER CODE
."
2085 PRINT
2100 FOR B=1 TO 4
2110 PRINT AT 19,0;"ENTER CHARAC
TER CODE FOR BORDER LINE ";B
2120 INPUT C
2130 LET D(B)=C
2140 NEXT B
2150 CLS
2160 PRINT "YOUR BORDERS WILL LO
OK LIKE THIS"
2190 FOR R=4 TO 14
2200 FOR B=1 TO 4
2210 PRINT AT R,13+B;CHR$ D(B)
2220 NEXT B
2230 NEXT R
2250 PRINT AT 19,0;"PRESS Y IF O
K, PRESS N TO REDO"
2260 INPUT Y$
2270 IF Y$<>"Y" THEN GOTO 1999
2300 FOR I=4 TO 1 STEP -1
2310 POKE 16664+4*I,D(I)
2320 NEXT I
2340 RETURN
2999 CLS
3000 PRINT "INPUT ANY PRINTABLE
CHARACTER    CODE. CODES WHICH RE
PRESENT      TOKENS WILL CRASH TH
E PROGRAM."
3010 INPUT E
3020 IF E>=192 THEN GOTO 3000
3030 IF E>=64 AND E<=127 THEN GO
TO 3000
3040 PRINT AT 10,13;"CHAR=";CHR$
 E
3050 PRINT AT  19,0;"OK? Y/N"
3060 INPUT Y$
3070 IF Y$<>"Y" THEN GOTO 2999
3080 POKE 16628,E
3090 RETURN
4000 CLS
4010 PRINT "[graphics]
[graphics]"
4020 PRINT AT 4,5;"ABCDEFGH"
4030 FOR I=5 TO 12
4040 PRINT AT I,4;I-4
4050 NEXT I
4100 LET ROW=5
4110 LET COL=5
4115 GOSUB 4400
4120 PRINT AT 15,0;"WHAT CODE DO
 YOU WISH TO DEFINE?"
4130 INPUT K
4140 IF K>255 THEN GOTO 4120
4150 PRINT AT 15,0;"USE ARROW KE
YS TO MOVE CURSOR   PRESS Z FOR
BLACK, M FOR WHITE  E FOR EXIT"
4200 PRINT AT ROW,COL;CHR$ (Z(RO
W-4,COL-4)*128)
4210 IF CODE INKEY$=112 THEN GOS
UB 4500
4220 IF CODE INKEY$=113 THEN GOS
UB 4600
4230 IF CODE INKEY$=114 THEN GOS
UB 4700
4240 IF CODE INKEY$=115 THEN GOS
UB 4800
4250 IF INKEY$="Z" THEN GOSUB 49
00
4260 IF INKEY$="M" THEN GOSUB 49
50
4270 IF INKEY$="E" THEN GOTO 430
0
4280 PRINT AT ROW,COL;"*"
4290 GOTO 4200
4300 FOR R=1 TO 8
4305 LET V=0
4310 FOR C=1 TO 8
4320 LET V=V+Z(R,C)*(2**(8-C))
4330 NEXT C
4340 PRINT AT R+4,15;V
4345 LET X(K,R)=V
4350 NEXT R
4360 PRINT AT 19,0;"OK? Y/N"
4370 INPUT Y$
4380 IF Y$="Y" THEN RETURN
4390 PRINT AT 19,0;"                "
4400 REM CLEAR Z(N,N)
4410 FOR R=1 TO 8
4420 FOR C=1 TO 8
4430 LET Z(R,C)=0
4440 NEXT C
4450 NEXT R
4460 RETURN
4500 REM CURSOR UP
4510 IF ROW=5 THEN RETURN
4520 LET ROW=ROW-1
4530 RETURN
4600 REM CURSOR DOWN
4610 IF ROW=12 THEN RETURN
4620 LET ROW=ROW+1
4630 RETURN
4700 REM CURSOR LEFT
4710 IF COL=5 THEN RETURN
4720 LET COL=COL-1
4730 RETURN
4800 REM CURSOR RIGHT
4810 IF COL=12 THEN RETURN
4820 LET COL=COL+1
4830 RETURN
4900 REM BLACK PIXEL
4910 LET Z(ROW-4,COL-4)=1
4914 PRINT AT ROW,COL;"[graphics]"
4920 RETURN
4950 REM WHITE PIXEL
4960 LET Z(ROW-4,COL-4)=0
4964 PRINT AT ROW,COL;" "
4970 RETURN
5000 REM PRINT BANNNER
5010 PRINT "ENTER THE STRING YOU
 WISH TO     PRINT."
5020 PRINT "TO ENTER A USER DEFI
NED CHAR-    ACTER, ENTER THE FUN
CTION MODE, THEN PRESS U. NOW EN
TER THE CODEOF THE UDG."
5030 PRINT "THE CODE NUMBER SHOU
LD APPEAR    AFTER THE CHR$ TOKEN
 IN YOUR     STRING."
5100 INPUT A$
5120 FOR I=1 TO LEN A$
5130 IF CODE A$(I)=214 THEN GOTO
 5400
5140 POKE 16528,CODE A$(I)
5150 RAND USR 16527
5160 NEXT I
5200 PRINT AT 19,0;"ANOTHER? Y/N
"
5204 INPUT Y$
5206 PRINT AT 19,0;"
 "
5210 IF Y$="Y" THEN GOTO 5120
5220 RETURN
5400 REM USER DEFINED GRAPHIC
5410 LET I=I+1
5420 FOR J=1 TO 8
5430 POKE 16515+J,X(VAL A$(I),J)
5440 NEXT J
5450 RAND USR 16551
5460 NEXT I
5470 GOTO 5160
```

QL REAL-TIME CLOCK

I wonder how many QL owners are aware of the fact that their QL may already contain a working real-time clock which, with the aid of a battery and a couple of diodes, may well give the battery-backed clock so many have requested. Dennis Briggs tipped me off to this, and as he has not yet made his findings generally known, I will pass on what I learned from him and my own experience on the subject.

The ZX8302 chip in the QL already contains all the circuitry for maintaining the time and date when the QL is switched off, except for a battery and a couple of diodes. Sinclair obviously intended to provide the battery back-up as the board has provision for at least one of the diodes, but this has been replaced by a wire link. It is easy to fit the necessary components and details of how to do this are provided later.

I suspect Sinclair did not incorporate the battery back up as it shows some lack of reliability on some machines and he did not want any more returned for service then he was already getting. Some of my friends and I have fitted batteries and diodes to five QLs with reasonable success. Of the five, two appear to work 100% reliably, one about 98% and the remaining two about 75% of the time. I would be interested to know how many more can be made to work. It appears that the failures which do occur happen on power up or down. I have monitored the crystal oscillation while the chip is under battery power and it seems absolutely reliable on all the QLs. With a large capacitor across the battery supply, only a slight change in mean level of the oscillator can be observed. From this I presume failure to maintain time is due to garbage getting into the clock registers due to lack of isolation of the master chip during the power up or down phase. If a way of deselecting the chip during switch on or off could be derived it should work 100%. To do this is appears that pulling its reset pin low should solve the problem.

Indeed, on one of the QLs modified it does isolate the master chip if the reset button is held down during switch on or off, unfortunately it does not seem to give complete success on other machines. Obviously Sinclair knew more development was required! As the addition of the battery and diodes is relatively easy it seems worth-while trying it if you like this feature - there seems a good chance it may work on your QL.

To install the components:

(1.) Connect two AAA type alkaline cells in series. I soldered wires to mine but beware if you do this as alkaline cells may explode if overheated. (I used a suitable plastic battery clip from Radio Shack - N.L.)

(2.) Remove the large chip marked ZX8302, IC 23 on the circuit board and bend out pin 40, the top RH pin. Take the usual precautions against static damage. While the chip is out solder the cathode ends (the ends marked with colored bands) of two germanium diodes to the bent out pin. Also solder a wire (black for negative) to pin 20 (bottom left) of the chip. Sleeve the diodes and solder the loose end of one to pin 11 of the chip. Do not let solder get down the pins as all but pin 40 have to be reinserted in the holder. The master chip usually has two resistors soldred to its pins and laying on top of the IC already (absent in my machine - N.L.).

(3.) Solder one end of a small capacitor, 0.1 mfd or so to a suitable groundpoint so its other end will reach pin 40 of the IC when it is replaced. I used the negative end of the small 100uf cap to the right of the master chip as a suitable ground.
(4.) Replace the IC.
(5.) Fit the remaining loose diode wire to battery positive and the blackwire from pin 20 of the IC to battery negative. Fit the loose end of the added capacitor wire to pin 40 where the two diode cathodes have been connected.

That's it. The battery should be insulated. I used sticky tape. The battery may be positioned immediately to the left of the master chip on top of the two smaller ICs. I used a stick pad on top of these ICs to stop the batteries moving. (The Radio Shack battery clip can be sticky padded to a bunch of resistors near the top left of the board, just to the right of the expansion connector. - N.L.) Don't forget to sleeve the diodes.

If you are lucky your QL clock will maintain the time until the batteries fail. This should be in about a year, judging from the current taken by the 8302 chip. If, like me, your are not so lucky, you will occasionally need to reset the clock. If the clock is very unreliable you may have to purchase more ZX8302s from Dennis Briggs and try and find a good one, but as I have no connection with Dennis other than as a fellow member of Quanta you must take this suggestion at face value!

Roy Barber
44 Dallin Road, Bexleyheath,
Kent DA6 8EJ.
Tel: 01-304 3856

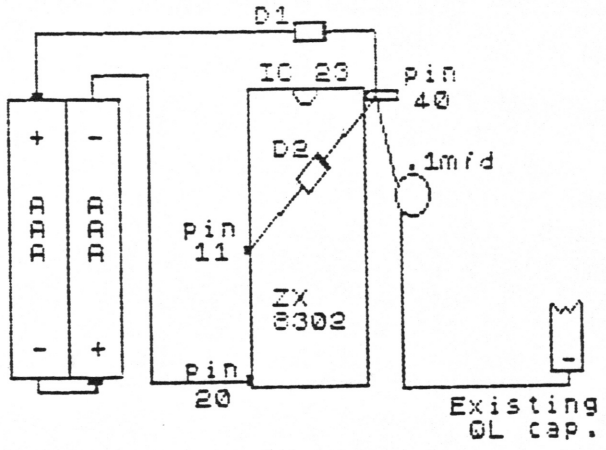
Uploader's Note:

This is an example of the kind of useful stuff you canfind in QUANTA. To subscribe, drop a note to the Secretary and Publisher:

Brian Pain
24 Oxford Street, Stony Stratford
Milton Keynes MK11 1JU.
Tel: (908) 564271

Include your VISA number for quick enrollment. My account was billed $24.41 for a year's worth.

As of this writing, my clock has been working perfectly through numerous on and off cycles for three days!



Norm Lehfeldt
CIS ID# 72466,3273

LUNAR LANDER

This LUNAR LANDER program is about the best we have seen. Use the joy-stick to land your ship, but you must be careful. You have to balance your thrust

You are scored on the time you take to land, and how far from the pad you land. If you land to hard it's all over and if you are to far from the pad you can't take-off for home.

```
  1 REM [illegible]
  5 GO SUB 400
 10 GO SUB 200+ STICK (1,1)
 11 IF STICK (2,1)=1 THEN GO SU
B 157
 20 LET sx=sx+ax: LET sy=sy+ay:
 LET x=x+sx: LET y=y+sy
 24 POKE 32300,x: POKE 32301,19
2-y: GO TO USR 32308
 147 RETURN
 148 LET ax=q: POKE 32302,96: RE
TURN
 149 LET ay=-q: RETURN
 150 LET ay=0: RETURN
 151 LET ay=q: RETURN
 155 RETURN
 156 LET ax=-q: POKE 32302,104:
RETURN
 157 LET ax=0: POKE 32302,88: RE
TURN
 200 LET ay=0: RETURN
 201 LET ay=q: RETURN
 202 LET ay=-q: RETURN
 204 LET ax=-q: POKE 32302,104:
RETURN
 208 LET ax=q: POKE 32302,96: RE
TURN
 210 LET ax=0: POKE 32302,88: RE
TURN
 356 RETURN
 400 CLS : LET q=.05: RESTORE 42
0: PLOT 0,4: FOR x=0 TO 247 STEP
 8: READ y: DRAW 8,y: NEXT x: DR
AW 7,-4: POKE 32304,0: POKE 3230
5,0: POKE 32302,88
 410 LET a$="                  "
: FOR i=6 TO 15 STEP 3: PRINT AT
 i,0;a$(i+1 TO );a$( TO i): NEXT
 i
 412 PLOT INK 7;103,3: DRAW 10,0
 414 RANDOMIZE : LET x=32+200*RN
D: LET y=192-10*RND: LET sx=-.5*
RND: LET sy=0: LET ax=sy: LET ay
=sy
 416 DEF FN t(a)=PEEK (a)+256*PE
EK (a+1)+65536*PEEK (a+2): LET t
0=FN t(23672)
 418 RETURN
 420 DATA 3,4,-1,-2,-3,-2,1,4,3,
-1,1,-3,-4,0,2,-2,2,3,2,4,-2,1,-
3,-4,-2,2,3,2,1,-1,-4,-3
 800 CLEAR 31999: POKE 23675,88:
 POKE 23676,127: BORDER 1: INK 7
: PAPER 1: CLS : GO SUB 2000: RE
STORE 1500: PRINT FLASH 1;AT 18,
0;"POKING DATA"; FLASH 0: LET hi
=0
 810 READ a,a$: IF a=0 THEN GO T
O 850
 820 FOR i=1 TO LEN a$-1 STEP 2:
 POKE a+(i-1)/2,16*(CODE a$(i)-4
8-7*(CODE a$(i)>57))+CODE a$(i+1
)-48-7*(CODE a$(i+1)>57): NEXT i
: GO TO 810
 870 CLS : BORDER 1: GO TO 1
1000 PRINT AT 0,0;
1030 IF (sy*sy+sx*sx)>.05 OR y>4
0 THEN POKE 32302,112: RANDOMIZE
 USR 32308: SOUND 6,6;7,7;8,16;9
,16;10,16;12,56;13,8: PAUSE 90:
SOUND 8,0;9,0;10,0: PRINT "CRASH
ED": LET score=200-INT (y): GO T
O 1050
1034 IF (x)108 OR x<101) THEN PR
INT "MISSED": FOR i=1 TO 4: FOR
j=20 TO 12 STEP -2: BEEP .01,j:
NEXT j: NEXT i: PLOT 107,4: DRAW
 0,24: PRINT AT 17,2;"This Is Wh
ere You Should Land";AT 1,0: LET
 score=400-INT (ABS (x-104.5)):
GO TO 1050
1038 BEEP .2,20: BEEP .3,10: LET
 to=INT ((PEEK (23672)-to)/50): PRI
NT "Down OK in ";to;" seconds":
LET score=INT (400+2000/to): GO
TO 1050
1050 PRINT "SCORE = ";score
1051 IF score>130 AND to>=50 THE
N PRINT AT 4,0; INK 5; FLASH 1;
BRIGHT 1;" Good Landing  but you
 have no          fuel for lift-o
ff          "
1053 IF score)=480 THEN PRINT AT
 3,9; BRIGHT 1; INK 2; PAPER 5;
FLASH 1; BRIGHT 1;"GREAT LANDING
"
1055 IF score)=hi THEN LET hi=sc
ore: PAUSE 120
1075 PRINT ; INK 6;AT 15,16;"HI-
SCORE = "; BRIGHT 1;hi: PAUSE 20
0
1085 PRINT AT 10,5;"PRESS BUTTON
 TO RESTART"
1090 IF STICK (2,1)=0 THEN GO TO
 1090
1095 IF STICK (2,1)=1 THEN CLS :
 GO TO 850
1100 IF y<8 THEN LET y =8
1110 IF y>191 THEN LET y=191
1122 LET sy=-sy: GO TO 24
1200 IF x<0 THEN LET x=0
1210 IF x>247 THEN LET x=247
1220 LET sx=-sx: GO TO 24
1500 DATA 32302,"587FA0A0587F2A3
07EED5B327ECD3D7F2A2C7E014C047CD
668D0018004 7DD6F8D022307EED5B2E7
EED53327ED5CDCC7ED1010A002803 01E
803C5D5E521C040CDB07E218048CDB07
E212048CD9C7E21E048CD9C7EE1D1CD2
67FC1C9"
1510 DATA 32393,"0E0021C47E06001
0FE7ED3FE230D20F5C9"
1520 DATA 32412,"1120000E087E191
706202BC81610F5240D20F2C9"
1530 DATA 32432,"7DF61F5F0E08062
0541A1FCB1E2310FB7DD6206F240D20E
EC9"
1540 DATA 32460,"E5CDE57E0E08C5C
D0A7FA620047923A62BC120030D20EFE
1C9"
1550 DATA 32486,"D5E5CB3DCB3DCB3
D7C4F0F0F0FE518477CE507B0C640677
98787E5E0856F7AE50747D1C9"
1560 DATA 32522,"243E07A4200A7DC
6206F38047CC6F867AF4FB01A13C31FC
B1910FBC9"
1570 DATA 32550,"E5CDE57E0E08C5C
D0A7FB6772379EB1772BC10D20F1E1C9"
1580 DATA 32573,"E5CDE57E0E08C5C
D0A7FEEFFA6772379EEFFA6772BC10D2
0ED E1C9"
1590 DATA 32600,"003C7E7E3C3C42C
31C3E7E7E3E44C2033877C7E7E7C2243C
024815A3C3C5A81240 10F1F3F3F3F1F0
7F0F3FCFCFCF3F330187C7C3CC961F06
0001CFFFFFFFEFC0C0000C0F37000030
3"
1600 DATA 0," "
2000 PRINT AT 2,3;"USE JOY-STICK
 TO LAND SHIP"''
2001 PRINT "UP      > High thrust
: accelerate
     up"''
2005 PRINT "DOWN    > Low Thrust:
  down slow"''
2030 PRINT "LEFT    > Thrust Left
"''
2040 PRINT "RIGHT   > Thrust Righ
t"''
2050 PRINT "BUTTON  > Cancel Late
ral Thrust"
2060 RETURN
3000 POKE 32442,0: POKE 32443,23
7: POKE 32444,103: POKE 32419,0:
 POKE 32423,237: POKE 32424,111
3005 STOP
9000 SAVE "lander" LINE 800
```

TS/1000 VERIFY

by DAVID NOWOTNIK

With only 8K of ROM in the TS/1000 it's little wonder that it hasn't a verify command. This little program will take care of that omission.

This routine is based on the LOAD routine in ROM. The change is when a byte is read off the tape. Instead of putting the byte into the approprite place in RAM, it is compared with the current byte at that address. If their is not a match, then the routine exits with an error message (R/0).

If all bytes match and the verification was successful, with no mis-match, than the 0/0 message will be returned at the end of the routine.

First enter this machine code loading routing, with 135 spaces or characters in the REM statment.

```
 10 REM .....(135 SPACES).....
 20 LET X=16514
 30 INPUT A$
 40 IF A$="S" THEN STOP
 50 LET J=16*(CODE A$-28)+CODE
A$(2)-28
 60 IF PEEK X=27 THEN POKE X,J
 70 LET X=X+1
 80 GO TO 30
```

Next RUN the program and enter these HEX digits.

```
CD 23 0F 37 11 00 00 CB 12 CB
0A CD 10 7C 18 FB 0E 01 06 00
0E 7F DB FE D3 FF 1F 30 49 17
17 38 28 10 F1 F1 BA D2 7A 7C
62 68 CD 10 7C CB 7A 79 20 03
6E 20 D6 23 17 30 F1 FD 34 15
21 09 40 50 CD 10 7C 00 CD 8C
7C 18 FB D5 1E 94 06 1A 1D DB
FE 17 CB 7B 7B 38 F5 10 F6 D1
20 04 FE 58 30 B2 3F CB 11 30
AD C9 7A A7 28 BB CF 0C E5 21
7C 40 37 ED 52 30 06 1A B9 28
02 CF 1A 13 2A 14 40 37 ED 52
E3 D0
```

Now the routine is in the long REM statment, and you can delete lines 20 through 80. DO NOT delete line 10. After these lines are deleted, add the next lines, 20 through 70. Then SAVE this before you go further, it is your VERIFY program.

```
20 LET X=16514
30 FOR I=31744 TO 31878
40 POKE I,PEEK X
50 LET X=X+1
60 NEXT I
70 NEW
```

To use the VERIFY routine, it must be loaded into your TS/1000, above RAM-TOP, before any other program. First lower RAM-TOP with these three direct commands...,

```
POKE 16388,123 -- ENTER
POKE 16389,255 -- ENTER
NEW -- ENTER
```

Now you may LOAD and RUN your VERIFY routine.

You now can type in your BASIC program. When you are ready to SAVE it, just SAVE it to tape as you would normally SAVE it. To VARIFY, rewind the tape to the start of the program, and type in, in direct commanded.

```
RAND USR 31744
```

And press play on your recorder and ENTER on your computer

If you saved the program with variables, then CLEARed them before verifying, or Changed the variables in any way then you may get a verify error (R/0). Otherwise, if all is well, you'll get an 0/0 message to tell you that your program has been VERIFIED.

TIC-TAC-TOE T/S 1000

This little program will play a pretty good game of TIC TAC TOE. We dont need instrutions to play the game, so just key it in on your 1000, and when the computer says "YOUR TURN" key in the number of the box you want your " X ". GOOD LUCK !!!

```
 10 CLS
 20 DIM C(9)
 30 LET C1=0
 40 GOSUB 999
 50 PRINT AT 4,25;"YOUR";AT 5,2
5;"MOVE"
 55 PRINT AT 6,25;"      ";AT
7,27;"  "
 60 INPUT M
 70 IF M>9 OR M<1 THEN GOTO 90
 80 IF C(M)=0 THEN GOTO 110
 90 PRINT AT 6,25;"ILLEGAL";AT
7,27;"MOVE"
 95 PAUSE 60
 100 GOTO 50
 110 LET C(M)=2
 120 GOSUB 1200
 130 GOSUB 540
 140 LET C1=C1+1
 150 IF E=1 OR C1=9 THEN GOTO 45
0
 160 PRINT AT 4,25;" MY "
 165 IF C1<3 THEN GOTO 300
 170 FOR X=1 TO 2
 180 GOSUB 710
 190 NEXT X
 300 LET M=5
 310 IF C(M)=0 THEN GOTO 390
 320 IF C(M)=1 THEN LET X=3
 330 IF C(M)=2 THEN LET X=1
 335 GOSUB 790
 336 IF M>0 THEN GOTO 390
 340 FOR M=X TO 9 STEP 2
 350 IF C(M)=0 THEN GOTO 390
 360 NEXT M
 370 LET M=INT (RND*9)+1
 380 IF C(M)<>0 THEN GOTO 370
 390 LET C(M)=1
 400 GOSUB 1200
 410 LET C1=C1+1
 420 GOSUB 540
 430 IF E=1 THEN GOTO 450
 440 IF C1<=8 THEN GOTO 50
 450 IF 0=0 THEN PRINT AT 7,25;"
A TIE"
 460 IF 0=1 THEN PRINT AT 7,25;"
I WON"
 470 IF 0=2 THEN PRINT AT 7,25;"
YOU WON"
 480 PRINT AT 8,23;"HIT ENTER"
 490 INPUT G$
 500 IF G$="" THEN GOTO 10
 510 STOP
 520 LET E=1
 530 RETURN
 540 LET E=0
 550 LET 0=C(5)
 560 IF 0=0 THEN GOTO 610
 570 IF C(1)=0 AND C(9)=0 THEN G
OTO 520
 580 IF C(2)=0 AND C(8)=0 THEN G
OTO 520
 590 IF C(3)=0 AND C(7)=0 THEN G
OTO 520
 600 IF C(4)=0 AND C(6)=0 THEN G
OTO 520
 610 LET 0=C(1)
 620 IF 0=0 THEN GOTO 650
 630 IF C(2)=0 AND C(3)=0 THEN G
OTO 520
 640 IF C(4)=0 AND C(7)=0 THEN G
OTO 520
 650 LET 0=C(9)
 660 IF 0=0 THEN RETURN
 670 IF C(3)=0 AND C(6)=0 THEN G
OTO 520
 680 IF C(7)=0 AND C(8)=0 THEN G
OTO 520
 690 LET 0=0
 700 RETURN
 710 FOR M=1 TO 9
 720 IF C(M)<>0 THEN GOTO 770
 730 LET C(M)=X
 740 GOSUB 540
 750 IF E=1 THEN GOTO 410-10*X
 760 LET C(M)=0
 770 NEXT M
 780 RETURN
 790 LET M=0
 800 FOR Y=2 TO 8 STEP 6
 810 IF C(Y)<>2 THEN GOTO 840
 820 IF C(4)=2 AND C(Y-1)=0 THEN
GOTO 860
 830 IF C(6)=2 AND C(Y+1)=0 THEN
GOTO 880
 840 NEXT Y
 850 RETURN
 860 LET M=Y-1
 870 GOTO 850
 880 LET M=Y+1
 890 GOTO 850
 999 FAST
1000 PRINT "▒▒▒
```

TOGGLING

Have you ever been frustrated with a program that had run-time errors caused by bad data, parameters, or values? Consider TOGGLING as a potential solution.

Some programs which are designed to receive data from keyboard entry endeavor to edit the entered data to prevent subsequent errors. This can be simple or complex programming, it may or may not detect all the errors and it can entail quite extensive program code to perform the edit. As an example the simple choice of a "Yes or No" option has to deal with the a sting variable of variable length, upper and lower case, and the correct characters.

```
e.g. 100 PRINT "Select Yes or No  "
     110 INPUT A$
     120 IF A$ = "Yes" THEN GOTO nnnn
     130 IF A$ = "yes" THEN GOTO nnnn
     140 IF A$ = "YES" THEN GOTO nnnn
     150 IF A$ = "No" THEN GOTO yyyy
     160 IF A$ = "no" THEN GOTO yyyy
     170 IF A$ = "NO" THEN GOTO yyyy
     180 GOTO 100
```

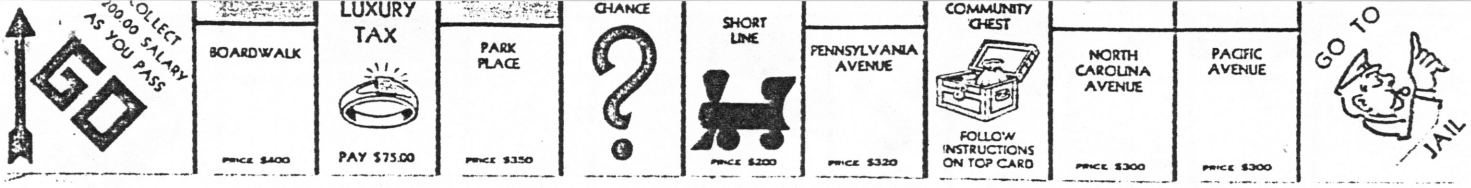
TOGGLING, even in this simple example, may be better.

```
e.g. 100 LET A$ = "Yes"
     110 PRINT "Select Yes or No  ";A$
     120 IF INKEY$ = " " THEN GOTO 120
     130 IF INKEY$ =(space)THEN LET A$ = "No"
     140 IF INKEY$ =(space)THEN GOTO nnnnn
     150 IF INKEY$ =(return)THEN GOTO yyyyy
     160 GOTO 120
```

The objective is to lock out the use of all keys except those that are to be used to TOGGLE the selections, one might want to modify the program to display the option available for selection or confirmation thru the use of appropriate PRINT statements.
What if the options were days of the week; Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, or Saturday? The number of permutations, for editing purposes, is significantly increased. TOGGLING may deal with these permutations by setting up an array with the appropriated character strings which could be index by a subscripted variable. The main purpose of this approach is to enable the programmer to, as much as possible, to establish a common subroutine for the user to select perdetermined options by use of the space key, to index the array for the correct option, and the enter key to confirm the selected option. With this approach in programming the option that has been confirmed, while it may not be correct for other reasons, it has to be acceptable to logical to the remainder of the program.

With this basic model and theory the author will leave the reader to be challanged in the exploitation or application of the model. All comments or discussion on the relative merits of TOGGLING are welcomed.

Paul O. Kinney
SLUG



MONOPOLY

The game of MONOPOLY is over 50 years old. The year was 1930, and the place was Germanstown, Pennsylvania. CHARLES DARROW was an out of work salesman, supporting himself and family by doing any odd job he could find. Between jobs he would invent things, such as a bat and ball game or a simplified scoring pad for bridge.

A game called THE LANDLORDS GAME had been around for five or six years, and Darrow set to work to reinvent and inprove it. One of the first things he did was to rename all the streets. In better times, he had spent his holidays in Atlantic City, and so all the street names were inspired by his happy memories.

His first sets were hand made and sold for $2.50, and his out put was six games a day. But demand soon grew and Darrow had to contract out the whole operation. When orders for wholsale lots started to come in he realized he had to sell his game to a manufacture for royalties or raise the capital and manufacture and market the game himself. Unwilling to take the risk, Darrow approached Parker Brothers; they turned him down. To them the game was to complicated and took too long to play.

Darrow continued to make and sell Monopoly on his own, and in the year 1934 he sold over 20,000. Buy 1935 his game was selling in F.A.O. Schwartz in New York. Parker Brothers then approached Darrow with a very attractive offer.

Now Monopoly is played all over the world. It is even smuggled behind the Iron Curtain. The game is played by the Pope ,the Queen of England and the Astronauts have played while in orbit.

Now it's time to play Monopoly on a computer. When you start the game, you must enter the number of players. The 2068 handles the bank, and knows how much money each player holds, which propertys, the number of houses, hotels, and rent to pay, or collect. It also handles Chance, Community Chest, Tax and $200 for PASSING GO.

When a player does not want to buy a property, the Bank will put it up for auction. If a player wishes to bid, he enters his player number and his bid. The Bank will subtract the cash amount from the high bidder and place the property in his column. The bank will not accept a bid less than 50% of the original price. The Bank will not allow houses or hotels to be built on a property unless a complete set is owned and none of the properties is mortgaged.

When buying or selling property, houses or hotels, three options are available.
Y/N ... yes or no
Y puts a house on a single property
A ... accepts house on a single property with option of another.
S ... Puts a house on all properties in a set.

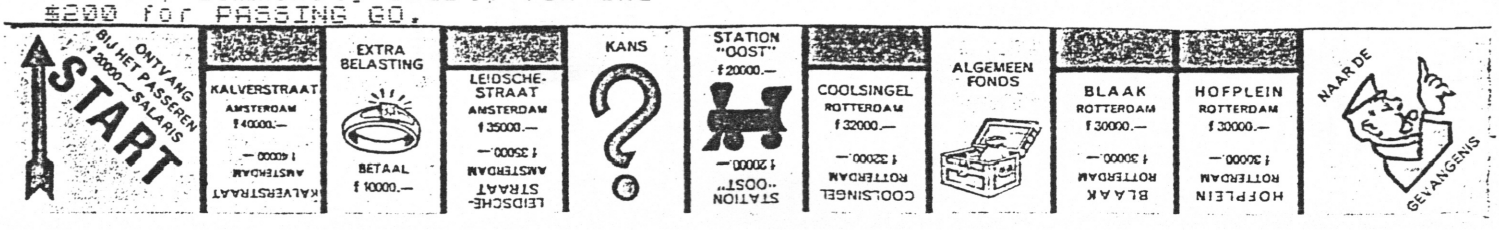
When entering an order, it is only necessary to type in what you require. There is no need to type in Park Place or Water Works, all properties are referred to by their initial letters. PP or WW will do. There is no need to type ENTER.

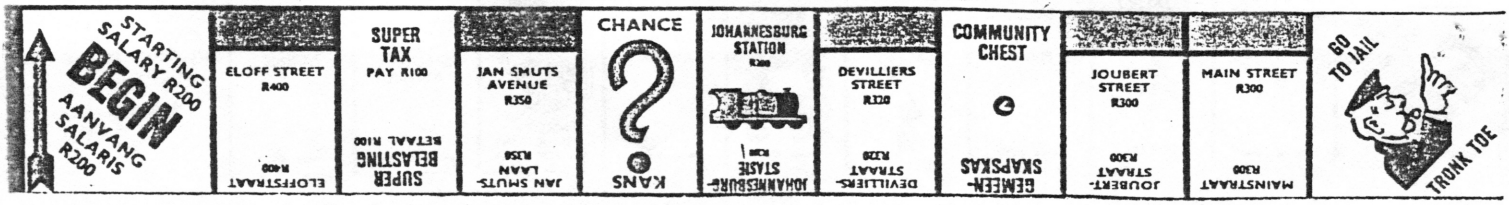
Players are distinguished by color:
1 > BLUE
2 > RED
3 > MAGENTA
4 > GREEN

The capital letters in the lines 405 to 490, 1800, 8960 to 8990 and 9530 to 9860 are graphics and should be entered in GRAPHIC MODE.

Now for the BAD NEWS the LISTing for this program is over 11 ft long so we will have to break it up, and and make it 3 issues long.

It all starts on the next page, so you can get started now or wait for the complete program






```
  10 GO SUB 9000
  30 RESTORE : GO SUB 1000: RAND
OMIZE : GO TO 1500
  100 GO SUB 5000: IF CODE a$<48
OR CODE a$>57 THEN GO TO 100
  104 LET b$=a$: PRINT AT 11,o+13
;b$
  105 IF CODE a$=48 THEN GO TO 16
0
  106 IF INKEY$<>"" THEN GO TO 10
5
  107 LET a$=""
  108 FOR i=0 TO 200
  109 IF INKEY$<>"" THEN LET a$=I
NKEY$: GO TO 112
  110 NEXT i
  112 BEEP .005,25: IF CODE a$<48
 OR CODE a$>57 THEN GO TO 114
  113 IF a$<>"" THEN LET b$=b$+a$
  114 PRINT AT 11,o+13;b$
  115 IF INKEY$<>"" THEN GO TO 11
5
  116 LET a$=""
  120 FOR i=0 TO 200
  130 IF INKEY$<>"" THEN LET a$=I
NKEY$: GO TO 145
  140 NEXT i
  145 BEEP .005,25: IF CODE a$<48
 OR CODE a$>57 THEN GO TO 155
  150 IF a$<>"" THEN LET b$=b$+a$
  155 PRINT AT 11,o+13;b$
  160 LET x=VAL b$
  170 RETURN
  200 LET a=-1: LET b=1
  205 FOR k=q TO p+1 STEP -1
  210 LET q=k: GO SUB 400
  215 LET p(y)=k-1
  220 GO SUB 380: NEXT k: GO TO 3
60
  300 LET a=1: LET b=-1
  305 IF q<p THEN GO TO 350
  306 LET f=9
  310 FOR k=q TO 40
  312 LET q=k: GO SUB 400
  313 LET p(y)=k+1
  315 GO SUB 380: NEXT k
  330 LET q=1: LET p(y)=1
  350 FOR k=q TO p-1
  351 LET q=k: GO SUB 400
  354 LET p(y)=k+1
  355 GO SUB 380: NEXT k
  375 RETURN
  380 FOR j=1 TO z
  382 IF s(j)<>9 THEN INK j: LET
q=p(j): GO SUB 460
  384 NEXT j
  390 LET q=p(y): GO SUB 450
  399 RETURN
  400 INK 0: BEEP .01,y#9-10
  405 IF q<12 THEN PRINT AT 21,(1
1-q)#2+o;"TU": GO TO 445
  410 IF q<22 THEN PRINT AT (22-q
)#2-1,o;"TU": GO TO 445
  420 IF q<32 THEN PRINT AT 0,(q-
31)#2+o;"RS": GO TO 445
  440 PRINT AT (q-31)#2+1,28;"TU"
  445 LET q=q+a
  450 FLASH 1: INK y
  460 IF q<12 THEN PRINT AT 21,(1
1-q)#2+o;"LM": GO TO 495
  470 IF q<22 THEN PRINT AT (22-q
)#2-1,o;"LM": GO TO 495
  480 IF q<32 THEN PRINT AT 0,(q-
31)#2+o;"LM": GO TO 495
  490 PRINT AT (q-31)#2+1,28;"LM"
  495 INK 0: LET q=q+b: FLASH 0
  499 RETURN
  500 LET n=INT (6*RND+1): LET dx
=4: LET dy=o+15
  571 LET a=n
  572 PAPER 5: GO SUB 700: GO SUB
 600
  578 LET n=INT (6*RND+1): LET dx
=15: LET dy=o+4
  579 PAPER 4: GO SUB 700: GO SUB
 600
  580 LET b=n
  590 PAPER 7: LET n=a+n: RETURN
  600 IF n=1 OR n=3 OR n=5 THEN P
RINT AT dx+1,dy+1;"P"
  610 IF n>1 THEN PRINT AT dx,dy;
"P";AT dx+2,dy+2;"P"
  620 IF n>3 THEN PRINT AT dx+2,d
y;"P";AT dx,dy+2;"P"
  630 IF n=6 THEN PRINT AT dx+1,d
y;"P";AT dx+1,dy+2;"P"
  640 RETURN
  700 PRINT AT dx,dy;"   ";AT dx+
1,dy;"   ";AT dx+2,dy;"   "
  710 RETURN
  800 PRINT AT 3,1;"      ";AT.3,0
; INK 0;"$";m(y): RETURN
  810 LET b=1
  811 IF m<0 THEN LET b=m(y)+m
  812 IF b<0 THEN GO TO 8800
  814 LET b=INT (m/20)
  815 IF b=0 THEN LET b=m
  820 LET v=ABS (m): LET c=m(y):
LET d=ABS (b)
  825 IF v<20 THEN LET d=1
  850 FOR i=1 TO v STEP d
  860 LET m(y)=m(y)+b
  870 GO SUB 800: BEEP .02,20: PA
USE 5: NEXT i
  880 LET m(y)=c+m: GO SUB 800
  890 RETURN
  900 FOR i=8 TO 13: PRINT AT i,o
+3;"                ": NEXT i: R
ETURN
  950 GO SUB 5000: PRINT AT 9,o+1
3;a$: LET b$=a$: GO SUB 5000: PR
INT AT 9,o+14;a$: LET b$=b$+a$
  955 RESTORE 1900: LET a$="XX":
LET a=0
  960 FOR i=1 TO 28
  970 IF a$=b$ THEN GO TO 980
  975 READ a$,a,w,x
  980 NEXT i
  990 RETURN
 1000 LET o=9: PRINT PAPER 4; INK
 0;AT 8,o+5;" MONOPOLY ";AT 9,o+
5;"written by"; PAPER 5;AT 11,o+
3;"BARRY de LOBEL"
 1001 PRINT INK 7; FLASH 1; PAPER
 2;AT 10,o+3;"                ";AT
 12,o+3;"                "
 1005 DIM a(40,2): DIM b(18,7): D
IM m(4): DIM p(4): DIM s(4): DIM
 c(16): DIM d(16): DIM h(4): DIM
 q(4): DIM x(10)
 1010 FOR j=1 TO 40
 1020 FOR i=1 TO 2
 1030 READ a(j,i)
 1050 NEXT i: NEXT j
 1060 FOR j=1 TO 18
 1070 FOR i=1 TO 7
 1080 READ b(j,i)
 1092 NEXT i: NEXT j
 1150 RETURN
```

```
1200 DATA 9,0,0,1,11,0,0,2,12,20
0,0,17,0,3,10,0,0,3,0,4,9,0,0,5,
0,18,0,5,0,6,0,17,0,7,11,0,0,7,0
,8,9,0,0,9,10,0,0,9,0,10,0,17,0,
11,0,11,0,18,0,12,13,0,0,13,0,13
,11,0,0,14,0,17,10,0,0,15,12,100
0,16
1210 DATA 60,2,10,30,90,160,250,
80,4,20,60,180,320,450,100,6,30,
90,270,400,550,120,8,40,100,300,
450,600,140,10,50,150,450,625,75
0,160,12,60,180,500,700,900,180,
14,70,200,550,750,950,200,16,80,
220,600,800,1000
1220 DATA 220,18,90,250,700,875,
1050,240,20,100,300,750,925,1100
,260,22,110,330,800,975,1150,280
,24,120,360,850,1025,1200,300,26
,130,390,900,1100,1275,320,28,15
0,450,1000,1200,1400,350,35,175,
500,1100,1300,1500,400,50,200,60
0,1400,1700,2000,200,25,50,100,2
00,0,0,150,4,10,0,0,0,0
1500 FOR i=1 TO 4: LET p(i)=1: L
ET m(i)=1500: LET s(i)=0: LET h(
i)=0: LET g(i)=0: NEXT i
1505 FLASH 0: BRIGHT 0: PAPER 7:
 BORDER 7: INK 0
1510 LET f=0: LET o=8: GO SUB 90
0
1520 PRINT AT 10,o+3;" ENTER NUM
BER"
1530 PRINT AT 11,o+3;"of PLAYERS
 2-4"
1535 IF INKEY$="" THEN GO TO 153
5
1540 BEEP .005,25: LET z=(CODE I
NKEY$)-48
1545 IF z<2 OR z>4 THEN GO TO 15
00
1550 GO SUB 5500
1560 FOR y=1 TO z
1561 LET a=0
1562 FOR i=1 TO z
1563 IF s(i)<>9 THEN LET a=a+1
1565 NEXT i
1566 IF a=1 THEN GO TO 1800
1569 IF s(y)=9 THEN GO TO 2210
1570 LET t=3: INK 0: LET p=p(y)
1600 PRINT AT 0,0;"PLAYER";AT 1,
1;y; INK y;AT 1,3;"LM": GO SUB 8
00
1610 GO SUB 900: GO SUB 1700: GO
 TO 2000
1700 RESTORE 1900: LET c=0
1710 FOR i=1 TO 28
1720 IF i>14 THEN LET c=3
1730 READ a$,a,w,x
1740 PRINT AT x,c;"   "
1750 LET b=a(a,1)
1760 IF b>500 THEN LET b=b-500
1770 LET d=INT (b/100)
1772 IF b>100 THEN LET b=b-100:
GO TO 1772
1775 INK 7: IF w>4 THEN INK 0
1780 IF d=y THEN PRINT AT x,c; P
APER w;a$
1783 INK 0
1785 IF d=y AND b=1 THEN PRINT A
T x,c+2;"*"
1790 NEXT i: RETURN
1800 GO SUB 900
1810 FOR i=1 TO z
1820 IF s(i)<>9 THEN LET a=i
1830 NEXT i
1840 PRINT PAPER 4; INK 0;AT 8,o
+5;" GAME OVER ";AT 9,o+5;"  WIN
NER   ", PAPER 5;AT 10,o+3;"PLAY
ER NUMBER ";a
1845 LET m=a
1850 PRINT INK 7; FLASH 1; PAPER
 2;AT 11,o+3;"                ";A
T 12,o+3;"                "
1855 PRINT FLASH 1; PAPER 6; INK
 0;AT 12,o+3;"PLAY AGAIN Y/N "
1856 GO SUB 5000
1857 IF a$<>"Y" THEN GO TO 1857
1858 RESTORE 1900
1859 GO SUB 900
1860 FOR i=1 TO 28
1865 READ a$,a,w,x
1870 IF i<23 THEN LET e=2: GO SU
B 6800
1875 LET b=a(a,1)
1880 IF b>100 THEN LET b=b-100:
GO TO 1880
1885 IF b=8 THEN LET a(a,1)=8: G
O TO 1895
1890 LET a(a,1)=0
1895 NEXT i
1898 GO SUB 8960
1897 LET p=p(m): GO SUB 8960: GO
 TO 30
1900 DATA "MA",2,4,4,"BA",4,4,5,
"OA",7,5,7,"VA",9,5,8,"CA",10,5,
9,"SC",12,3,11,"SA",14,3,12,"VA"
,15,3,13,"SJ",17,0,15,"TA",19,0,
16,"NY",20,0,17,"KY",22,2,19,"IN
",24,2,20,"IL",25,2,21
1910 DATA "AA",27,6,4,"VA",28,6,
5,"MG",30,6,6,"PA",32,4,8,"NC",3
3,4,9,"PA",35,4,10,"PP",38,1,12,
"BU",40,1,13," R",8,0,15,"PN",16
,0,16,"BO",26,0,17,"SL",36,0,18,
"EC",13,0,20,"UW",29,0,21
2000 IF s(y)<>0 THEN GO SUB 4300
: GO TO 2002
2010 INK 0: GO SUB 900: GO SUB 8
00
2012 LET r=0
2015 FOR i=1 TO 5: GO SUB 500: N
EXT i
2017 IF a=b THEN LET t=t-1: LET
r=1: LET s(y)=0
2018 IF t=0 THEN GO TO 4200
2019 IF s(y)<>0 THEN LET p=11: G
O TO 2100
2020 LET q=p: LET p=p+n
2021 IF p>40 THEN LET p=p-40: LE
T f=9
2025 GO SUB 300
2030 LET s=0: LET a=a(p,1)
2031 IF a>500 THEN LET a=a-500:
LET s=1
2032 IF f=9 THEN GO SUB 900: PRI
NT AT 10,o+5;"   PASS GO ";AT 11
,o+5;"COLLECT $200": LET m=200:
GO SUB 810
2034 GO SUB 900: LET f=0
2035 IF a>100 THEN LET f=f+1: LE
T a=a-100: GO TO 2035
2040 IF a=0 THEN LET b=a(p,2): P
RINT AT 10,o+4;" FOR SALE $";b(b
,1): GO TO 3000
2045 IF f<>y AND a>1 AND a<9 THE
N GO TO 3200
2050 IF a=10 THEN GO TO 8000
2060 IF a=11 THEN GO TO 8100
```

```
2060 IF a=12 THEN PRINT AT 11,0+
3;"    TAX $";a(p,2): LET m=-a(p,
2): GO SUB 810: GO TO 2100
2090 IF a=13 THEN GO TO 4200
2100 PRINT AT 15,0+10;"          "
;AT 16,0+10;" CHANCE ";AT 17,0+1
0;"          ";AT 4,0+4;"
;AT 5,0+4;" CHEST  ";AT 6,0+4;"
"
2104 INK y: LET q=p: GO SUB 460
2105 IF r=1 THEN GO SUB 900: PRI
NT AT 10,0+4;"[illegible]";AT
11,0+4;"[illegible]": FOR w=1
TO 80: NEXT w: GO TO 2000
2110 GO SUB 900: INK y: PRINT AT
 8,0+4;"[illegible]";AT 9,0
+4;"[illegible]";AT 11,0+4;"
[illegible]";AT 12,0+4;"[illegible]
[illegible]";AT 13,0+4;"[illegible]
[illegible]"
2115 INK 0: PRINT AT 10,0+4;"[illegible]
[illegible]": GO SUB 5000
2116 GO SUB 900
2120 IF a$="1" THEN GO SUB 6000:
 GO TO 2110
2130 IF a$="2" THEN GO SUB 6500:
 GO TO 2110
2140 IF a$="8" THEN GO SUB 7000:
 GO TO 2110
2150 IF a$="9" THEN GO SUB 6900:
 GO TO 2110
2160 IF a$="0" THEN LET e=0: GO
SUB 7500: GO TO 2110
2210 NEXT y: GO TO 1560
2500 DATA 2,4,4,7,9,10,12,14,15,
17,19,20,22,24,25,27,28,30,32,33
,35,38,40,40,13,29,13
2600 RESTORE 2500
2605 LET e=0
2610 FOR i=1 TO 8
2615 IF e=1 THEN GO TO 2640
2620 READ v,w,x
2630 IF v=a OR w=a OR x=a THEN L
ET e=1
2640 NEXT i
2650 RETURN
2700 LET e=0: LET v=a(v,1): LET
w=a(w,1): LET x=a(x,1)
2710 IF v>100 THEN LET v=v-100:
GO TO 2710
2720 IF w>100 THEN LET w=w-100:
GO TO 2720
2730 IF x>100 THEN LET x=x-100:
GO TO 2730
2740 IF v>2 OR w>2 OR x>2 THEN L
ET e=1
2750 RETURN
3000 PRINT AT 11,0+4;"DO YOU WAN
T TO"
3010 PRINT AT 12,0+6;" BUY IT Y/
N?"
3020 GO SUB 5000
3022 IF a$<>"Y" THEN GO TO 3500
3025 LET b=a(p,2)
3030 LET m=-b(b,1): LET f=0: GO
SUB 810: LET a(p,1)=2+(y*100)
3036 IF p=13 OR p=29 THEN LET a(
p,1)=8+(y*100)
3037 GO SUB 1700: GO SUB 4000: G
O TO 2100
3200 PRINT AT 10,0+4;" RENT OWED
 TO"
3210 PRINT AT 11,0+4;"  PLAYER "
;f
3215 IF a=8 THEN GO TO 3250
3220 LET b=a(p,2): LET c=b(b,a)
3222 IF s=1 AND a=2 THEN LET c=c
*2
3224 PRINT AT 12,0+4;"     $";c
3230 LET m=-c: LET x(8)=c: LET x
(9)=f: GO SUB 810: LET m(x(9))=m
(x(9))+x(8): GO TO 2100
3250 LET b=4: IF s=1 THEN LET b=
10
3255 PRINT AT 12,0+3;"    $";b*n
3256 LET x(8)=b*n: LET x(9)=f
3260 LET m=-b*n: GO SUB 810: LET
 m(x(9))=m(x(9))+x(8): GO TO 210
0
3500 GO SUB 900
3510 PRINT AT 8,0+4;"[illegible]
[illegible]";AT 9,0+4;"THE"
3520 RESTORE 1900: LET a=0
3530 FOR i=1 TO 28
3540 IF p=a THEN GO TO 3560
3550 READ b$,a,w,x
3560 NEXT i
3570 GO SUB 7800
3580 PRINT AT 10,0+4;"BID PLAYER
 "
3581 GO SUB 5000: LET c=CODE a$:
 LET c=c-48
3582 IF c=0 THEN GO TO 2100
3583 IF c<1 OR c>7 OR s(c)=9 THE
N GO TO 3581
3584 LET e=c
3585 PRINT AT 10,0+4; PAPER c; I
NK 7;"BID PLAYER ";c;" "
3588 PRINT AT 10,0+15;c;AT 11,0+
4;"AMOUNT $"
3590 GO SUB 100: PRINT AT 12,0+4
;"AGREED Y/N"
3600 GO SUB 5000: IF a$<>"Y" THE
N GO TO 3500
3601 LET b=a(p,2): LET b=b(b,1)
3602 IF x<b/2 THEN GO TO 3500
3605 LET b=m(e)-x
3606 IF b<0 THEN GO TO 3500
3610 LET a(a,1)=2+e*100: LET m=-
x
3612 IF a=13 OR a=29 THEN LET a(
a,1)=8+e*100
3615 IF e=y THEN GO SUB 810: GO
SUB 1700: GO TO 3620
3616 LET m(e)=m(e)-x
3620 GO SUB 4000: GO TO 2100
4000 FOR i=1 TO 40
4010 IF a(i,1)>500 THEN LET a(i,
1)=a(i,1)-500: GO TO 4010
4020 NEXT i
4021 FOR i=6 TO 36 STEP 10
4022 LET a=100*INT (a(i,1)/100)
4023 IF a=0 THEN GO TO 4030
4024 LET b=a(i,1)-a
4025 IF b=1 THEN LET a(i,1)=a+1:
 GO TO 4030
4026 LET a(i,1)=a+2
4030 NEXT i
4040 RESTORE 2500
```

Thats it for this issue, we will have more next month.

MONOPOLY

Here we go with this months installment. But first a few corrections in last months listing:

The capital P in quotation marks in lines 600 to 630 are Graphics

The capitals LM in quotation marks in line 1600 are Graphics

Also lines 1900 & 1910 should be changed to.....

```
1900 DATA "ME",2,4,4,"BA",4,4,5,
"OR",7,5,7,"VM",9,5,8,"CO",10,5,
9,"SC",12,6,11,"ST",14,3,12,"VA"
,15,3,13,"SJ",17,0,15,"TE",19,0,
18,"NY",20,0,17,"KY",22,2,19,"IN
",24,2,20,"IL",25,2,21
1910 DATA "AT",27,6,4,"VE",28,6,
5,"MG",30,6,6,"PA",32,4,8,"NC",3
3,4,9,"PE",35,4,10,"PP",36,1,12,
"BW",40,1,13,"RA",6,0,15,"PR",16
,0,16,"BO",26,0,17,"SL",36,0,18,
"EC",13,0,20,"WW",29,0,21
```

```
4050 FOR i=1 TO 9
4060 READ v,w,x
4070 LET a=INT (a(v,1)/100): LET
 b=INT (a(w,1)/100): LET c=INT (
a(x,1)/100)
4073 LET e=1+a*100
4075 IF a(v,1)=e OR a(w,1)=e OR
a(x,1)=e THEN GO TO 4090
4080 IF a=b AND b=c AND c<>0 THE
N LET a(v,1)=a(v,1)+500: LET a(w
,1)=a(w,1)+500: LET a(x,1)=a(x,1
)+500
4085 IF a(x,1)>1000 THEN LET a(x
,1)=a(x,1)-500
4090 NEXT i
4100 LET a=100*INT (a(6,1)/100):
 LET v=a(6,1)-a: IF v=1 THEN LET
 a=0
4101 LET b=100*INT (a(16,1)/100)
: LET v=a(16,1)-b: IF v=1 THEN L
ET b=0
4102 LET c=100*INT (a(26,1)/100)
: LET w=a(26,1)-c: IF w=1 THEN L
ET c=0
4103 LET d=100*INT (a(36,1)/100)
: LET x=a(36,1)-d: IF x=1 THEN L
ET d=0
4105 IF a=0 THEN GO TO 4115
4110 LET a(6,1)=a(6,1)+(a=b)+(a=
c)+(a=d)
4115 IF b=0 THEN GO TO 4125
4120 LET a(16,1)=a(16,1)+(b=a)+(
b=c)+(b=d)
4125 IF c=0 THEN GO TO 4135
4130 LET a(26,1)=a(26,1)+(c=a)+(
c=b)+(c=d)
4135 IF d=0 THEN GO TO 4150
4140 LET a(36,1)=a(36,1)+(d=b)+(
d=c)+(d=a)
4150 RETURN
4200 PRINT AT 11,o+4;"[GO TO JA
IL]": LET q=p: LET p=11
4210 IF q<11 THEN GO SUB 300: GO
 TO 4225
4220 GO SUB 200
4225 LET s(y)=3
4230 LET r=0: LET t=3: GO TO 210
0
4300 GO SUB 900
4305 IF s(y)=1 THEN GO TO 4400
4310 PRINT AT 9,o+3;"[YOU ARE IN
 JAIL]";AT 10,o+3;" DO YOU WISH T
O ";AT 11,o+3;"PAY £50 FINE Y/N"
4320 GO SUB 5000: IF a$="Y" THEN
 GO TO 4400
4330 LET s(y)=s(y)-1
4340 RETURN
4400 GO SUB 900: PRINT AT 10,o+5
;"[PAY £50]";AT 11,o+5;"[
]"
4410 LET m=-50: LET f=0: GO SUB
810
4420 LET s(y)=0: RETURN
5000 LET c=1: LET k=1
5001 IF INKEY$<>"" THEN GO TO 50
01
5002 LET a$=INKEY$: IF a$<>"" TH
EN GO TO 5010
5003 LET k=k+1: IF k<>10 THEN GO
 TO 5002
5004 LET k=1: LET c=c+1: IF c>z
THEN LET c=1
5005 IF s(c)<>9 THEN LET q=p(c):
 INK c: GO SUB 460
5008 GO SUB 390: GO TO 5002
5010 BEEP .005,25: LET k=CODE a$
5020 IF k>96 THEN LET k=k-32
5030 LET a$=CHR$ k: LET k=0: RET
URN
5500 LET g=1: LET h=1
5501 FOR i=1 TO 16
5502 LET c(i)=i: LET d(i)=i
5503 NEXT i
5510 FOR i=1 TO 16
5520 LET b=INT (16*RND)+1
5530 LET c=INT (16*RND)+1
5540 LET a=c(i): LET c(i)=c(b):
LET c(b)=a
5550 LET a=d(i): LET d(i)=d(c):
LET d(c)=a
5560 NEXT i: RETURN
6000 PRINT AT 8,o+4;"[BUY PROPER
TY]";AT 9,o+4;"WHICH ?"
6020 GO SUB 950: GO SUB 7800
6030 IF a=0 OR d=0 OR c=y THEN G
O TO 6200
6034 GO SUB 2600: IF e=0 THEN GO
 TO 6040
6035 GO SUB 2700: IF e=1 THEN GO
 TO 6200
6040 LET e=c
6065 PRINT AT 10,o+4;"FROM PLAYE
R ";c;AT 11,o+4;"AMOUNT £"
6070 GO SUB 100: PRINT AT 12,o+4
;"AGREED Y/N"
6080 GO SUB 5000: IF a$<>"Y" THE
N GO TO 6200
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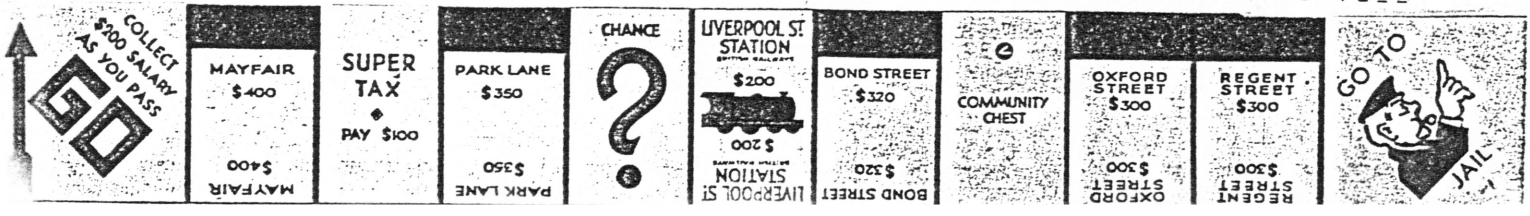
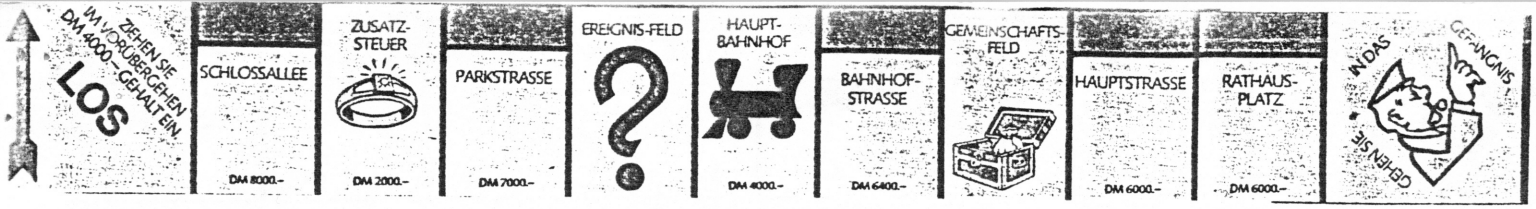
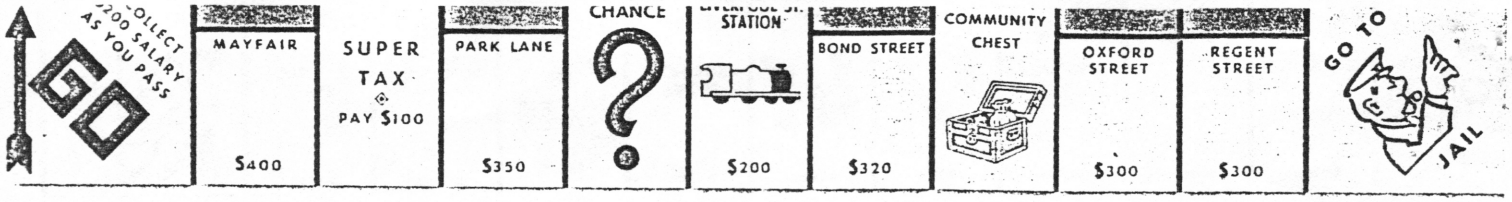
```
6105 IF a=6 OR a=16 OR a=26 OR a
=36 THEN GO TO 6120
6110 IF b>2 AND b<8 THEN GO TO 6
200
6120 LET a(a,1)=b+y*100: LET m=-
x: LET f=e: LET x(3)=x: LET x(4)
=e: GO SUB 810: LET m(x(4))=m(x(
4))+x(3)
6130 GO SUB 1700: GO SUB 4000
6200 RETURN
6500 PRINT AT 8,o+3;"BUY HOUSE
HERE";AT 9,o+4;"FOR ?"
6510 LET x(7)=0: GO SUB 950
6514 LET x(5)=0: GO SUB 7800
6515 IF a=0 OR d<500 OR c<>y OR
b=7 THEN GO TO 6700
6565 LET x(6)=w: LET e=b
6566 LET b=h(1)+h(2)+h(3)+h(4)
6567 LET v=g(1)+g(2)+g(3)+g(4)
6568 IF e=6 AND v=12 THEN GO TO
6750
6569 IF e=6 THEN GO TO 6580
6570 IF b=32 THEN GO TO 6750
6580 LET b=INT ((a-1)/10)+1
6585 IF x(7)>0 THEN GO TO 6620
6590 PRINT AT 10,o+4;"COST $"
6592 PRINT AT 10,o+13;b*50
6594 PRINT AT 11,o+4;"ACCEPT Y/N
"
6595 PRINT AT 12,o+3;"S=BUILD SE
T"
6596 PRINT AT 13,o+3;"A=ACCEPT &
 MORE"
6600 GO SUB 5000: IF a$="A" THEN
 LET x(5)=1: GO TO 6620
6605 IF a$="S" THEN GO TO 6710
6610 IF a$<>"Y" THEN GO TO 6700
6620 LET a(a,1)=a(a,1)+1
6625 LET e=e+1: GO SUB 6800: LET
 m=-b*50: LET f=0: LET x(4)=e: G
O SUB 810
6630 IF x(4)=7 THEN LET g(y)=g(y
)+1: LET h(y)=h(y)-4: GO TO 6650
6640 LET h(y)=h(y)+1
6650 IF x(5)=1 THEN LET w=x(6):
GO TO 6514
6660 IF x(7)>0 THEN GO TO 6710
6700 RETURN
6710 IF x(7)=3 THEN GO TO 6700
6715 LET b$="SET"
6720 GO SUB 2600
6725 IF w=x AND x(7)=2 THEN GO T
O 6700
6730 LET x(7)=x(7)+1
6734 IF x(7)=1 THEN LET a=v: LET
 w=x(6): GO TO 6514
6735 IF x(7)=2 THEN LET a=w: LET
 w=x(6): GO TO 6514
6736 IF x(7)=3 THEN LET a=x: LET
 w=x(6): GO TO 6514
6750 GO SUB 900: PRINT AT 10,o+4
;"NOW FOR SALE"
6760 FOR w=1 TO 100: NEXT w
6770 GO TO 6700
6800 INK 4
6803 IF e=2 THEN LET d=32: LET c
=32
6805 IF e=3 THEN LET d=153: LET
c=32
6810 IF e=4 THEN LET d=154: LET
c=32
6820 IF e=5 THEN LET d=153: LET
c=154
6830 IF e=6 THEN LET d=154: LET
c=154
6840 IF e=7 THEN LET d=160: LET
c=160: INK 2
6850 IF a<11 THEN PRINT AT 19,(1
1-a)*2+o;CHR$ c;CHR$ d: GO TO 68
90
6860 IF a<21 THEN PRINT AT (22-a
)*2-2,o-2;CHR$ c;CHR$ d: GO TO 6
890
6870 IF a<31 THEN PRINT AT 2,(a-
21)*2+o;CHR$ c;CHR$ d: GO TO 689
0
6880 PRINT AT (a-31)*2,30;CHR$ d
;CHR$ c
6890 INK 0: RETURN
6900 PRINT AT 8,o+3;"SELL PROPER
TY";AT 9,o+4;"WHICH ?"
6910 GO SUB 950: GO SUB 7800
6920 IF a=0 OR c<>y THEN GO TO 6
999
6930 GO SUB 2600: IF e<>1 THEN G
O TO 6940
6935 GO SUB 2700: IF e=1 THEN GO
 TO 6999
6940 PRINT AT 10,o+4;"TO PLAYER
"
6941 GO SUB 5000: LET c=CODE a$:
 LET c=c-48
6942 IF c<1 OR c>z OR s(c)=9 THE
N GO TO 6941
6943 IF c=y THEN GO TO 6999
6945 LET e=c
6949 PRINT AT 10,o+14;c;AT 11,o+
4;"AMOUNT $"
6950 GO SUB 100: PRINT AT 12,o+4
;"AGREED Y/N"
6960 GO SUB 5000: IF a$<>"Y" THE
N GO TO 6999
6965 LET m=m(e)-x
6966 IF m<0 THEN GO TO 6999
6980 LET a(a,1)=b+e*100: LET m=x
: LET x(3)=x: LET x(4)=e: GO SUB
 810: LET m(x(4))=m(x(4))-x(3)
6990 GO SUB 1700: GO SUB 4000
6999 RETURN
7000 PRINT AT 8,o+3;"BUY HOUSE
HERE";AT 9,o+4;"WHERE ?"
7010 LET x(7)=0: GO SUB 950
7020 LET x(5)=0: GO SUB 7800
7030 IF c<>y OR b<3 THEN GO TO 7
200
7075 LET x(6)=w: LET e=b
7080 LET b=INT ((a-1)/10)+1
7090 IF x(7)>0 THEN GO TO 7160
7110 PRINT AT 10,o+4;"PRICE $"
7118 PRINT AT 10,o+13;b*25
7120 PRINT AT 11,o+4;"ACCEPT Y/N
"
7122 PRINT AT 12,o+3;"S=SELL SET
"
7125 PRINT AT 13,o+3;"A=ACCEPT &
 MORE"
7130 GO SUB 5000: IF a$="A" THEN
 LET x(5)=1: GO TO 7160
7135 IF a$="S" THEN GO TO 7300
```





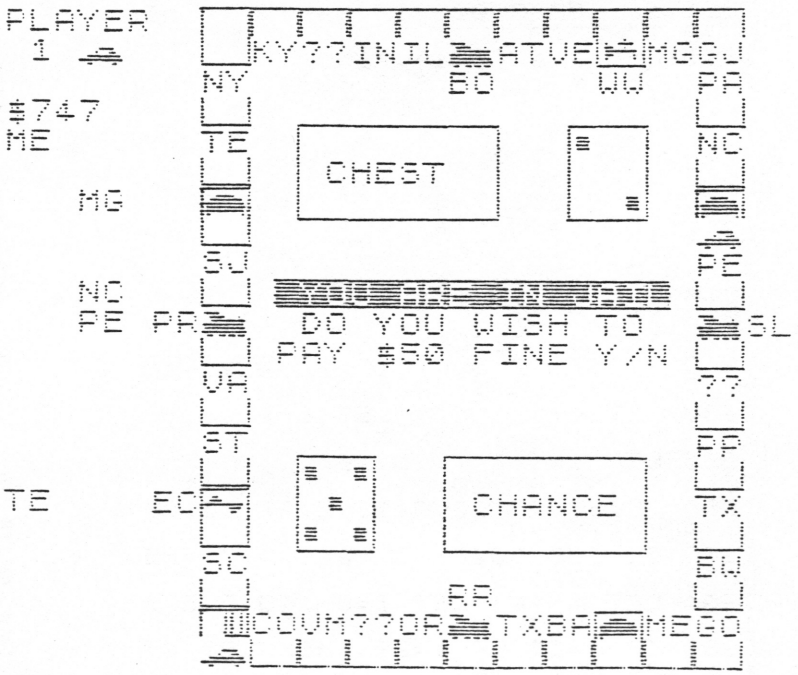

```
7140 IF a$<>"Y" THEN GO TO 7200
7160 LET a(a,1)=a(a,1)-1
7170 LET e=e-1: GO SUB 6800: LET
 m=+b#25: LET x(4)=e: GO SUB 810
7175 IF x(4)=6 THEN LET g(y)=g(y
)-1: LET h(y)=h(y)+4: GO TO 7190
7180 LET h(y)=h(y)-1
7190 IF x(8)=1 THEN LET w=x(8):
GO TO 7020
7195 IF x(7)>0 THEN GO TO 7300
7200 RETURN
7300 IF x(7)=3 THEN GO TO 7200
7310 LET b$="SET"
7315 GO SUB 2800
7320 IF w=x AND x(7)=2 THEN GO T
O 7200
7340 LET x(7)=x(7)+1
7350 IF x(7)=1 THEN LET a=v: LET
 w=x(6): GO TO 7020
7355 IF x(7)=2 THEN LET a=w: LET
 w=x(6): GO TO 7020
7360 IF x(7)=3 THEN LET a=x: LET
 w=x(6): GO TO 7020
7500 PRINT AT 8,o+3;"[illegible]
[illegible]";AT 9,o+4;"WHICH ?"
7510 GO SUB 950: GO SUB 7600
7550: IF (b>2 AND b<8) OR c<>y T
HEN GO TO 7700
7560 IF b=1 AND e=1 THEN GO TO 7
700
7570 IF b=1 THEN GO TO 7900
7580 LET b=a(a,2): LET e=b(b,1)/
2
7610 PRINT AT 10,o+4;"AMOUNT $"
7620 PRINT AT 10,o+13;e;AT 12,o+
4;"ACCEPT Y/N"
7630 GO SUB 5000: IF a$<>"Y" THE
N GO TO 7700
7650 LET a(a,1)=1+y*100
7660 LET m=e: GO SUB 810
7670 GO SUB 1700: GO SUB 4000
7700 RETURN
7800 LET d=a(a,1)
7805 LET b=d
7810 IF b>500 THEN LET b=b-500
7820 LET c=INT (b/100)
7830 IF b>100 THEN LET b=b-100:
GO TO 7830
7840 INK 7: IF w>4 THEN INK 0
7850 PRINT AT 9,o+13; PAPER w;b$
7860 INK 0: RETURN
7900 PRINT AT 8,o+3;"[illegible]
[illegible]";AT 9,O+4;"PROPERTY"
7930 LET b=a(a,2): LET e=b(b,1)/
2
7935 LET e=e+INT (e/10)
7940 PRINT AT 10,o+4;"AMOUNT $"
7950 PRINT AT 10,O+13;E;AT 12,O+
4;"ACCEPT Y/N"
7960 GO SUB 5000: IF a$<>"Y" THE
N GO TO 7999
7964 LET m=-e: LET f=0: GO SUB 8
10
7965 IF a=13 OR a=29 THEN LET a(
a,1)=8+y*100: GO TO 7980
7970 LET a(a,1)=2+y*100
7980 GO SUB 1700: GO SUB 4000
7999 RETURN
8000 LET a=c(g)
8005 PRINT AT 15,o+10; FLASH 1;"
      ";AT 16,o+10;" CHANCE ";
AT 17,o+10;"
```

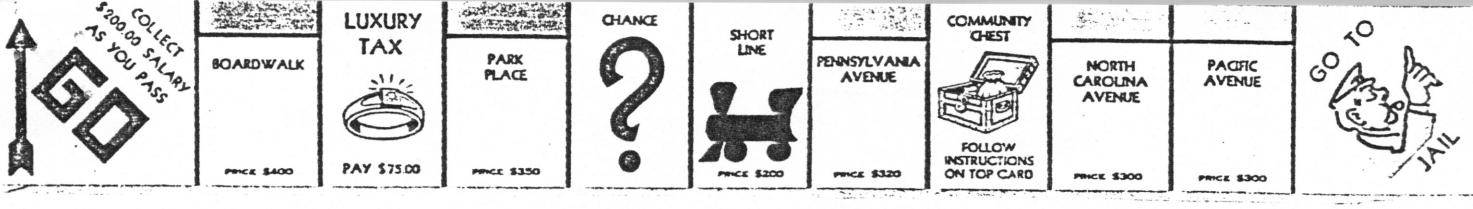
```
8010 LET g=g+1: IF g=17 THEN GO
SUB 5500
8020 RESTORE 8500
8040 GO TO 8200
8100 LET a=d(h)
8105 PRINT AT 4,o+4; FLASH 1;"
      ";AT 5,o+4;" CHEST  ";AT 6
,o+4;"
8110 LET h=h+1: IF h=17 THEN GO
SUB 5500
8120 RESTORE 8600
8140 GO TO 8200
8200 FOR i=1 TO a
8210 READ a$,b$,c$,b,c
8220 NEXT i
8230 GO SUB 900
8240 PRINT AT 9,o+4;a$;AT 10,o+4
;b$;AT 11,o+4;c$
8250 IF b=1 THEN GO TO 8400
8260 IF b=2 THEN LET m=-c: GO SU
B 810: GO TO 2100
8270 IF b=3 THEN LET m=c: GO SUB
 810: GO TO 2100
8280 IF b=4 THEN LET m=50: GO SU
B 810: GO TO 2100
8290 IF b=5 THEN GO TO 8700
8300 IF b=6 THEN GO TO 4200
8310 IF b=7 THEN LET q=p: LET p=
p-3: GO SUB 200: GO TO 2030
8320 IF b=8 THEN GO TO 8450
8350 PRINT AT 12,o+4;"PAY FINE Y
/N"
8360 GO SUB 5000
8370 IF a$="Y" THEN LET m=-10: G
O SUB 810: GO TO 2100
8380 GO TO 8000
8400 LET q=p: LET p=c
8402 IF c=2 THEN GO SUB 200: GO
TO 2030
8420 GO TO 2025
8450 FOR k=1 TO I
8455 IF k=y OR s(k)=9 THEN GO TO
 8470
8460 LET m=10: GO SUB 810: LET m
(k)=m(k)-10
8470 NEXT k
8475 FOR w=1 TO 100: NEXT w
8480 GO TO 2100
8500 DATA "ADVANCE TO St.C","IF
YOU PASS GO","COLLECT $200",1,12
,"MOVE TO PENN RR","IF YOU PASS
GO","COLLECT $200",1,16
8510 DATA "ADVANCE TO ILL","IF Y
OU PASS GO","COLLECT $200",1,25,
" ","ADVANCE TO B.W.","  ",1,40,
 ","ADVANCE TO GO","  ",1,1
8520 DATA " ","SPEEDING FINE","
   $15",2,15," ","PAY SCHOOL FE
ES","     OF $150",2,150," ","DR
UNK DRIVING","    FINE $2 0",2,20
0
8530 DATA "YOU HAVE WON A","CROS
SWORD","COLLECT $100",3,100,"BUI
LDING LOAN","  MATURES","RECEIVE
 $150",3,150,"BANK PAYS YOU","  D
IVIDEND","  OF $50",3,50
8540 DATA "RETIREMENT FUND","REC
EIVE $50","  ",4,50
```




```
8550 DATA "STREET REPAIRS","$40
PER HOUSE","$115 PER HOTEL",5,1,
"GENERAL REPAIRS","$25 PER HOUSE
",,"$100 PER HOTEL",5,2
8560 DATA " "," "," ",8,0," GO
BACK","THREE SPACES",,8,,7,0
8600 DATA " ","GO BACK TO","MED
AVE ",1,2," ","ADVANCE TO GO","
",1,1
8610 DATA "DOCTORS FEE"," PAY
$50"," ",2,50,"PAY HOSPITAL","
 $100"," ",2,100,"PAY INSURANCE
","PREMIUM $50"," ",2,50
8620 DATA "BANK ERROR","COLLECT
$200"," ",3,200,"INTEREST ON","
SHARES $25"," ",3,25,"INCOME TAX
","REFUND","COLLECT $20",3,20,"
SALE OF STOCK","COLLECT $50"," "
,3,50
8630 DATA "ANNUITY MATURES","COL
LECT $100"," ",3,100,"YOU INHERI
T"," $100"," ",3,100,"YOU HAVE
WON A","BEAUTY CONTEST","COLLEC
T $10",3,10
8640 DATA "VETERANS FUND","RECEI
VE $50"," ",4,0
8660 DATA " "," "," "," ",8,0
8670 DATA "YOUR BIRTHDAY","COLLE
CT $10","OFF EACH PLAYER",8,0,"P
AY A $10 FINE","  OR TAKE A","
 CHANCE",9,0
8700 IF c=2 THEN LET m=(h(y)*25)
+(g(y)*100): GO TO 8720
8710 LET m=(h(y)*40)+(g(y)*115)
8720 PRINT AT 12,o+4;"TOTAL = $"
;m
8725 FOR w=1 TO 50: NEXT w
8730 LET m=-m: GO SUB 810
8750 GO TO 2100
8800 LET x(1)=m: LET x(2)=a
8805 INK y: PRINT AT 8,o+3;"[illegible]
[illegible]"
8807 FOR w=1 TO 100: NEXT w
8808 GO SUB 900: PRINT AT 8,O+4;
"[illegible]";AT 11,O+4;"[illegible]
[illegible]";AT 12,O+4;"[illegible]
[illegible]";AT 13,O+4;"[illegible]
[illegible]"
8810 INK 0: PRINT AT 10,O+4;"[illegible]
[illegible]": GO SUB 5000
8820 GO SUB 900
8830 IF a$="8" THEN GO SUB 7000:
 GO TO 8860
8840 IF a$="9" THEN GO SUB 6900:
 GO TO 8860
8850 IF a$="0" THEN LET e=1: GO
SUB 7500: LET e=0: GO TO 8860
8855 IF a$="0" THEN GO TO 8900
8858 GO TO 8808
8860 LET m=x(1): LET a=x(2): GO
TO 810
8900 IF f=0 THEN GO TO 8920
8910 LET m(f)=m(f)+m(y)
8920 RESTORE 1900
8925 FOR i=1 TO 28
8930 READ a$,a,w,x: LET b=a(a,1)
8932 IF b>500 THEN LET b=b-500
8934 LET k=INT (b/100)
8935 IF b>100 THEN LET b=b-100:
GO TO 8935
8936 IF i<23 AND k=y THEN LET e=
2: GO SUB 6800
8937 IF f=0 AND b=3 AND k=y THEN
 LET a(a,1)=8: GO TO 8945
8938 IF f=0 AND k=y THEN LET a(a
,1)=0: GO TO 8945
8939 IF b=8 AND k=y THEN LET a(a
,1)=8+f*100: GO TO 8945
8940 IF k=y THEN LET a(a,1)=2+f*
100
8945 NEXT i
8950 LET s(y)=9
8955 GO SUB 8960: GO SUB 4000: G
O TO 2210
8960 IF p<12 THEN PRINT AT 21,(1
1-p)*2+o;"TU": GO TO 8995
8962 CLEAR 63928
8970 IF p<22 THEN PRINT AT (22-p
)*2-1,o;"TU": GO TO 8995
8980 IF p<32 THEN PRINT AT 0,(p-
21)*2+o;"RS": GO TO 8995
8990 PRINT AT (p-31)*2+1,28;"TU"
8995 RETURN
9000 REM draw screen
9005 RESTORE 9020
9007 IF PEEK USR "c"=0 THEN GO T
O 9010
9008 GO TO 9500
```

We'll finish it up next time, but here is what the game will look like when you get it up and runing.





MONOPOLY part 3

This will finish up the listing we started in March. In this months installment the capital letters in lines 9530 to 9560 are graphics.

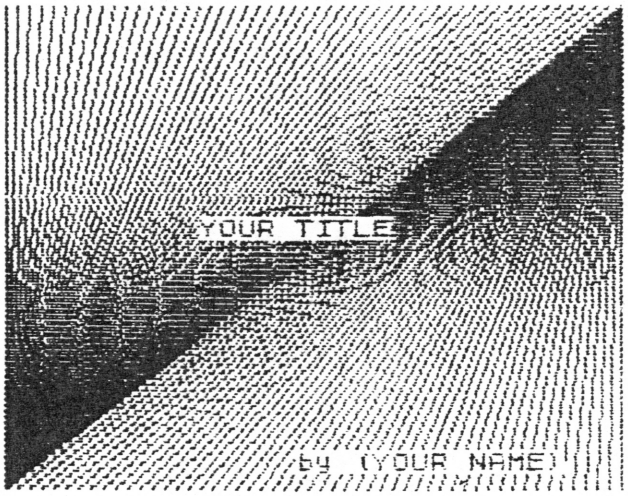
I know you will enjoy playing this game. It's as close to the real thing as you can get

```
9008 GO TO 9500
9010 BORDER 7: PAPER 7: INK 0: C
LS : PRINT FLASH 1; PAPER 1; INK
 7;AT 10,10;"PLEASE WAIT": FLASH
 0: FOR i=0 TO 167: READ a
9015 POKE USR "a"+i,a: NEXT i
9020 DATA 0,124,31,31,127,127,12
7,51
9021 DATA 0,0,8,252,252,252,254,
108
9022 DATA 128,145,156,159,156,14
4,128,255
9023 DATA 65,241,65,249,9,9,1,25
5
9024 DATA 255,128,135,159,191,19
1,191,160
9025 DATA 255,1,225,249,253,253,
253,5
9026 DATA 255,128,140,158,191,12
8,128,128
9027 DATA 255,1,1,1,253,121,49,1
9028 DATA 255,165,165,165,165,16
5,165,255
9029 DATA 16,48,112,240,240,240,
240,240
9030 DATA 17,51,119,255,255,255,
255,255
9031 DATA 0,0,0,1,2,31,127,24
9032 DATA 0,0,0,240,56,252,254,2
4
9033 DATA 0,0,0,0,0,0,0,0
9034 DATA 0,0,0,0,0,0,0,0
9035 DATA 0,0,60,60,60,60,0,0
9036 DATA 248,168,248,168,255,17
3,255,255
9037 DATA 255,128,128,128,128,12
8,128,128
9038 DATA 255,1,1,1,1,1,1,1
9039 DATA 128,128,128,128,128,12
8,128,255
9040 DATA 1,1,1,1,1,1,1,255
9500 LET o=8
9510 BORDER 7: PAPER 7: INK 0: C
LS
9520 FOR i=0 TO 10
9530 PRINT AT 0,i*2+o;"R8"
9532 PRINT AT i*2+1,o;"TU"
9534 PRINT AT i*2+1,o+20;"TU"
9536 PRINT AT 21,i*2+o;"TU"
9540 NEXT i
9550 PRINT AT 1,o+16;"CD"
9551 PRINT AT 20,o;"RI";AT 20,o+
16;"EF"
9552 PRINT AT 6,o;"EF";AT 6,o+20
;"EF";AT 16,o;"GH"
9560 PRINT AT 1,o+10;"AB";AT 20,
o+10;"AB";AT 10,o;"AB";AT 10,o+2
0;"AB"
9565 PAPER 7: INK 0
9566 PRINT AT 2,o+10;"BO";AT 2,o
+16;"WW"
9567 PRINT AT 10,6;"PR";AT 10,22
+o;"SL";AT 16,6;"EC"
9568 PRINT AT 19,o+10;"RR"
9570 PRINT AT 1,o+4;"??";AT 20,o
+6;"??";AT 12,o+20;"??"
9575 PAPER 0: INK 7
9580 PRINT AT 1,o+20;"GJ";AT 20,
o+20;"GO";AT 16,o+20;"TX";AT 20,
o+12;"TX"
9655 PAPER 2: INK 7
9660 PRINT AT 1,o+2;"KY";AT 1,o+
6;"IN";AT 1,o+8;"IL"
9665 PAPER 6: INK 0
9670 PRINT AT 1,o+12;"AT";AT 1,o
+14;"VE";AT 1,o+18;"MG"
9755 PAPER 5: INK 0
9760 PRINT AT 20,o+2;"CO";AT 20,
o+4;"VM";AT 20,o+8;"OR"
9765 PAPER 4: BRIGHT 1:: INK 7
9770 PRINT AT 20,o+14;"BA";AT 20
,o+18;"ME"
9855 PAPER 0: BRIGHT 0: INK 7
9860 PRINT AT 2,o;"NY";AT 4,o;"T
E";AT 8,o;"SJ"
9865 PAPER 3: INK 7
9885 PRINT AT 12,o;"VA";AT 14,o;
"ST";AT 18,o;"SC"
9900 PAPER 4: INK 7
9902 PRINT AT 2,o+20;"PA";AT 4,o
+20;"NC";AT 8,o+20;"PE"
9904 PAPER 1: INK 7
9908 PRINT AT 14,o+20;"PP";AT 18
,o+20;"BW"
9910 PAPER 7: INK 0
9912 PLOT o*8+31,144
9914 DRAW 65,0: DRAW 0,-25: DRAW
 -65,0: DRAW 0,25
9916 PLOT o*8+119,144
9918 DRAW 25,0: DRAW 0,-25: DRAW
 -25,0: DRAW 0,25
9920 PLOT o*8+144,31
9930 DRAW -65,0: DRAW 0,25: DRAW
 65,0: DRAW 0,-25
9934 PLOT o*8+56,31
9936 DRAW -25,0: DRAW 0,25: DRAW
 25,0: DRAW 0,-25
9940 PRINT AT 5,o+5;"CHEST"
9945 PRINT AT 16,o+11;"CHANCE"
9950 RETURN
9999 SAVE "monopoly" LINE 1
```

```
  10 REM MUSIC MAKER
  20 GO SUB 350
  30 REM
  40 POKE 23561,3
  50 POKE 23562,1
  60 LET o=0
  70 LET sf=1
  80 DIM n(10)
  90 LET d=.1
 100 FOR x=1 TO 10
 110 READ n(x)
 120 NEXT x
 130 GO TO 300
 140 DATA 16,0,2,4,5,7,9,11,12,1
4
 150 PAUSE 0: LET a$=INKEY$
 160 IF a$<"0" OR a$>"9" THEN GO
 TO 230
 170 LET a=CODE a$-47
 180 BEEP d,n(a)+o+sf-1
 190 LET sf=1
 200 POKE 23692,20
 210 GO TO 150
 220 STOP
 230 IF a$="z" THEN LET d=d/2
 240 IF a$="q" THEN POKE 23561,3
5: POKE 23562,5: STOP
 250 IF a$="x" THEN LET d=d+d
 260 IF a$="c" THEN LET o=o-12
 270 IF a$="v" THEN LET o=o+12
 280 IF a$="s" THEN LET sf=2
 290 IF a$="f" THEN LET sf=0
 300 PRINT AT 10,10;"
                    "
 310 PRINT AT 10,10;"dur= ";d
 320 PRINT AT 8,10;"                 "
 330 PRINT AT 8,10;"oct= ";INT (
o/12)
 340 GO TO 150
 350 REM  instr
 360 CLS
 370 PRINT AT 0,9;"MUSIC PROGRAM
"
 380 PRINT AT 0,0; OVER 1;"_____
_____"
 390 PRINT
 400 PRINT "This program enables
 you to play"
 410 PRINT "simple tunes. The le
ngth of the"
 420 PRINT "note is variable, as
 is the"
 430 PRINT "                octave."
 440 PRINT
 450 PRINT "z - halve duration"
 460 PRINT "x - double duration"
 470 PRINT "c - down 1 octave"
 480 PRINT "v - up 1 octave"
 490 PRINT "q - quit "
 500 PRINT "s - sharpen next not
es"
 510 PRINT "f - flatten next not
es"
 520 PRINT
 530 PRINT "  TOP ROW OF KEYS AR
E THE NOTES"
 540 PRINT TAB 9;"STARTING AT C"
 550 PRINT AT 20,5;"Press any ke
y to start": PAUSE 0: CLS : RETU
RN
 560 RETURN
```

LOADING SCREEN

This 17 line program will give you a neat loading screen for your programs. Just place your program name in LINE 34, then, in IMMEDIATE MODE, save it with the LINE command to start on line 2. Once the SCREEN program is saved on tape, you save your program on the tape right after it.




```
  2 LET a=INT (RND*4)+3
  4 INK a
  6 BORDER 0
  8 PAPER 0: CLS
 10 FOR f=0 TO 255 STEP 5
 12 PLOT 0,10
 14 DRAW f,165
 16 NEXT f
 18 FOR f=0 TO 255 STEP 5
 20 PLOT 255,175
 22 DRAW -f,-165
 24 NEXT f
 25 PRINT AT 9,10; INK 7;"YOUR
TITLE"
 28 PRINT AT 19,15; INK 7;"by (
YOUR NAME)"
 30 INK 0
 32 PRINT AT 20,0;
 34 LOAD "TITLE"
```

copywrite by Jim Pitts

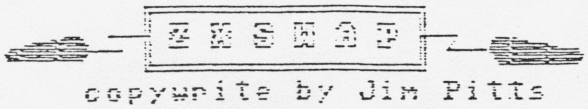
Just about every active Sinclair user now posseses a 2050 modem in some form. Perhaps the best use for these devices is trading programs over the phone lines. For TS1000 and ZX81 users only one commercial program has been available (Mini Xmod 1.7) to accomplish this. Mini Xmod 1.7 has been rated by several authors as extremely difficult to use. It also comes with a pretty hefty pricetag. ZXSWAP was written to fill the gap between bulletin board oriented terminal programs and the need for a simple program to allow program uploading and downloading between users. There is no facility in ZXSWAP for typing from your keyboard to a remote terminal. Other programs fill that need quite adequately. ZXSWAP is ,however , so easy to use that you may find it hard to believe that it actually works!

First ZXSWAP is loaded into your machine (16k or more ram attached). If you are uploading a program to another user press L at the menu and a loading pattern will appear. Now load the program that you intend to upload from tape. When the load is complete the menu will return to your screen. Call your friend and have them load their copy of ZXSWAP. When the downloading user is ready, simply set down the phone and press U for upload. The downloader will press D. ZXSWAP will then take control and the transfer will be made. When the transfer is complete the modem LEDs will go out and a checksum will appear on each screen. Get back on the phone and verify the checksums. The downloader now presses S and saves his new program to tape. THAT'S IT! With only four possible key presses (U,D,L,and S) you've done it.

ZXSWAP is great for users groups, people working on a common programming project, or friends who often swap programs. Anything which can be put in program form can be sent so those word processors that save with their text files should transfer just fine. It would also be a simple matter to write programs which to store data files in REMs or arrays which would transfer easily.The display file is also transfered so graphics are another possibility.

ZXSWAP will premiere at the T/S Computerfest in Indianapolis on May 2,1987. A special Computerfest price is planned. You can also order the program directly from the author at $8.00 for one copy or $12.00 for two copies ppd.

Send orders to: Jim Pitts
1434 Goddard Ave.
Louisville, KY 40204



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